

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York.

Vol. XXII: No. 25.

New York, Thursday, December 19, 1878.

\$4.50 a Year, Including Postage.  
Single Copies, Ten Cents.

## Clayton's Air Compressor.

In addition to its application for a variety of purposes in manufacture and industry, compressed air has slowly conquered a position in the art of mining. Although of recent growth only, dating as it does in Europe from Colladon's experiments at the Mont Cenis in 1860, and in this country from Doane's trials at the Hoosac Tunnel, the use of rock drills in excavating in hard ground, and therefore the utilization of the expansive power of compressed air, occupies a prominent rank in mining operations and in tunneling. The history of air compressors has naturally been intimately associated with the progress of rock drills, and will in the future be largely dependent upon the rapidity with which the universal use of the latter is established, a matter which is now only a question of time. American ingenuity has done much to bring the economical working of air compressors to its present status—in fact, it may be claimed that, in conjunction with Continental designers, American machinists have developed this modern type of machinery to a perfection to which English constructors have added but little.

We present in the accompanying illustration an air compressor embodying some new and important features, by Mr. James Clayton, 14 and 16 Water street, Brooklyn, N. Y. The general plan of the machine has been favorably known in the market for some years, and to this general design Mr. Clayton has closely adhered in making his improvements. The compressor is built both single and double acting, has both the steam cylinder and the air cylinder bolted down to a common bed-plate, the piston rod communicating the power through a yoke or slotted crosshead to the compression piston. The yoke or crosshead runs on a guide, provided with set-screws, so that the weight of the yoke is in no danger of producing unequal wear of the pistons, while the weight of the piston rods and the pistons are carried by the guide. In order to secure a steady motion a heavy fly-wheel is used, which is moved by a crank working in a sliding journal box in the crosshead. The journal box of the main crank, as well as that by which the valve-rod is driven, are both made with tapered brasses bearing equally upon both crosshead and crank pin, so that, by tightening a couple of screws, wear or lost motion is taken up equally on both pins and crossheads. This very neat device is one of Mr. Clayton's patents, and is shown very clearly in the small illustration.

An arrangement is provided by which a small stream of water is run into the water-jacketed air cylinder with the air. This water is collected in the air receiver and may be used over again. As will be seen, the compressor has a Steele air governor, fully described and illustrated in *The Iron Age* of Sept. 19, 1878. It can be set at any desired pressure, which will be maintained with almost perfect uniformity even when the variations of steam pressure are considerable or the variation in the consumption of air great. By regulating the throttle valve it will furnish the necessary power under varying conditions. Thus when, for instance, a number of rock drills suspend work, steam will be throttled and a correspondingly smaller amount of air be compressed. Besides its tendency to economize, this feature will act beneficially upon the rock drills by making less frequent the sudden jarring spurts which act so injuriously upon them and render such heavy and solid construction necessary.

## English Views of American Competition.

A correspondent writing from London recently says:

The journalists of England are only just beginning to awaken to the importance of the change which has taken place in regard to the commercial relations of England and America. Even now they touch the subject lightly, and with a tendency to make it a peg whereon to hang general discourses on free trade and the injurious consequences of strikes. The *Globe* glanced at it yesterday in a note, chiefly intended as a warning to English workmen not to strengthen the hands of foreigners by renewing the disastrous struggles between labor and capital, "which have done so much of late years to paralyze our native industry." So long as the United States sent to Great Britain the surplus of their cereal produce all was well. Not only did such an arrangement offer no ground for alarm, but this supplementing of local and European supplies was an immense advantage to England. When, in addition to corn, we received bacon, beef, and meats of all kinds in tins, only the English butchers grumbled. The general public welcomed the imports which helped to keep down the price of the necessities of life. But now that America takes her stand on a level with us in those manufactures in which we have hitherto been supreme, the competition is one which may well excite the gravest anxiety. Among recent imports from America are boots and shoes, perfumery, jewelry and piece goods. "We have no right to complain of these invasions," says the *Globe*, "but it certainly behooves us to endeavor to meet the Americans by producing, if possible, better manufactured articles at equally moderate prices." Easily said, my friend. How is it to be done? This is the problem of the time. If England cannot

solve it, and there is only that one solution, her manufacturing supremacy is clean gone. In the ordinary course of things the day must come when the old country must take a back seat, or at all events admit to the front rank with her the young and busy Republic which has sprung from her loins. There are old-fashioned commercial men who would at this juncture partially revive the old days of protection; but the liberal spirit of the country is altogether opposed to such a retrograde movement. That England has a right to look for mere reciprocity at the hands of the older countries is certain. On the face of it, nothing seems more absurd than the free export to Belgium of raw materials, which come back to us in the shape of manufactured goods, to undersell us in our home markets. In regard to America, the day will come when she can afford to indulge in the luxury of free trade. Politicians of the Manchester school blame the United States that she has not altered her tariff long ago; but even severe political economists must admit that in the early days of a nation, manufacturing enterprise must be fostered and encouraged. Protection gives the first basis to industrial operations. The wonderful progress of American manufactures during the last 20 years is the best answer to men like Jacob Bright. England

vestment being the purchase of land. Every Frenchman, when he can, becomes the owner of the house in which he lives. Of course he is greatly aided in this by the French land laws and laws of inheritance, which cut the whole country up into small holdings. Savings banks with government security, building clubs, sick clubs and friendly societies are also in favor, but no money is tied up in trades' unions. Strikes of course occur, but in some industrial centers they are very rare, as for instance, in the woolen districts. Some authorities say that the French workmen have not yet felt and do not know their power, and believe that they will ultimately become more difficult to deal with. We doubt this explanation, because politically the French workmen have repeatedly shown that they are alive to the strength which combination gives; they understand that strength, and they have used it, often with sad consequences to themselves; but socially and commercially they have not proved themselves fond of trades' unionism, and we believe those are right who tell us that the French workman is, as a rule, well aware that his interests are bound up with his employer's, and that strikes are suicidal. How many British workpeople hold consols! In 1874 the number of persons entitled to divi-

generation, is more than anything else to be blamed for the want of thrift among our industrial classes. From father to son the traditional maxim goes, "Why save when there are the rates to fall back on?"

## The Chemical Composition and Physical Properties of Steel Rails.

Before the meeting of the American Institute of Mining Engineers, Dr. C. B. Dudley, chemist of the Pennsylvania Railroad Company, read a paper on the chemical composition and physical properties of Bessemer steel rails, from which we take the following suggestive data. Assuming that, with the exception of some minor variations, the treatment which Bessemer steel receives during manufacture is constant or always alike, Dr. Dudley contends that the question how to obtain a good rail becomes one as to the chemical composition of the steel, and that appropriate physical tests or inspection will reveal steel from a bad blow. Therefore the question which Dr. Dudley has labored to solve, viz., How shall the Pennsylvania Railroad Company obtain steel rails which shall give satisfactory wear and be uniform in quality?

| Ton per million tons.              | Location.      | Carbon. | Phosphorus. | Manganese. | Silicon. | Total in Phos. units. | Tens. strength<br>1000 lbs. | Elastic limit<br>1000 lbs. | Elongation, per cent. |
|------------------------------------|----------------|---------|-------------|------------|----------|-----------------------|-----------------------------|----------------------------|-----------------------|
| Did not Break or Crush in Service. |                |         |             |            |          |                       |                             |                            |                       |
| 48                                 | 10° C. & T. T. | 336     | 079         | 458        | 061      | 31.3                  | 71                          | 32                         | 25                    |
| 47                                 | T. ....        | 283     | 114         | 234        | 030      | 29.0                  | 68                          | 28                         | 22                    |
| 47                                 | 2° C. ....     | 281     | 1057        | 354        | 068      | 25.9                  | 71                          | 33                         | 21                    |
| 45                                 | 9° C. ....     | 337     | 056         | 374        | 056      | 27.1                  | ...                         | ...                        | ...                   |
| 37                                 | 85° C. ....    | 233     | 041         | 268        | 074      | 19.7                  | 66                          | 25                         | 38                    |
| 35                                 | T. ....        | 209     | 058         | 326        | 030      | 24.1                  | 69                          | 28                         | 38                    |
| 34                                 | 4 1/2° C. .... | 245     | 075         | 426        | 041      | 26.6                  | 73                          | 30                         | 21                    |
| 33                                 | 4° C. ....     | 231     | 087         | 364        | 047      | 26.0                  | 69                          | 30                         | 20                    |
| 27                                 | 4° C. ....     | 228     | 111         | 318        | 016      | 25.8                  | 66                          | 27                         | 23                    |
| 25                                 | 10° C. ....    | 286     | 083         | 318        | 023      | 27.3                  | 75                          | 46                         | 29                    |
| 25                                 | 10° C. ....    | 353     | 103         | 576        | 059      | 36.5                  | 79                          | 33                         | 24                    |
| 17                                 | T. ....        | 210     | 065         | 272        | 028      | 20.6                  | 67                          | 23                         | 55                    |
| Broke or Crushed in Service.       |                |         |             |            |          |                       |                             |                            |                       |
| 37                                 | T. ....        | 303     | 166         | 316        | 032      | 24.6                  | 70                          | 32                         | 10                    |
| 34                                 | C. ....        | 343     | 127         | 670        | 036      | 39.3                  | 75                          | 30                         | 20                    |
| 31                                 | 4 1/2° C. .... | 204     | 181         | 354        | 020      | 36.9                  | 78                          | 34                         | 19                    |
| 29                                 | T. ....        | 368     | 130         | 458        | 000      | 35.1                  | 61                          | 26                         | 9                     |
| 17                                 | T. ....        | 573     | 075         | 853        | 182      | 52.9                  | 102                         | 43                         | 14                    |
| 14                                 | Unknown.       | 350     | 134         | 626        | 058      | 40.5                  | 80                          | 33                         | 15                    |
| 10                                 | 9° C. ....     | 323     | 135         | 522        | 045      | 36.4                  | 80                          | 36                         | 15                    |
| 5                                  | T. ....        | 154     | 132         | 552        | 050      | 38.5                  | ...                         | ...                        | ...                   |
| 3                                  | 10° C. ....    | 386     | 127         | 530        | 053      | 35.8                  | 80                          | 47                         | 10                    |
| 3                                  | 17° C. ....    | 416     | 155         | 460        | 034      | 40.3                  | 81                          | 30                         | 14                    |
| 3                                  | 20° C. ....    | 300     | 138         | 412        | 024      | 33.8                  | 66                          | 26                         | 14                    |
| 0                                  | Unknown.       | 387     | 056         | 670        | 035      | 33.6                  | 72                          | 30                         | 6                     |
| 0                                  | T. ....        | 359     | 156         | 505        | 035      | 39.4                  | 78                          | 39                         | 17                    |

\* O—Curve. † T—Tangent.

From our present knowledge it may be stated that phosphorus and (in a less degree) silicon harden steel, make it brittle, and at the same time make it liable to fracture from percussion or blows. Carbon (and in a less degree) manganese render steel hard and brittle, but at the same time, up to a certain extent, they add to the strength but diminish its ductility or percentage of elongation, carbon doing this almost directly in proportion to its percentage, while manganese does not diminish it as rapidly as carbon. Now, a steel rail must be able to resist strain as well as abrasion or wear. It must be hard enough to resist crushing and not be so brittle as to break under the strains or blows to which it is subjected. Therefore there is a limit beyond which any addition to the amount of these hardeners—phosphorus, silicon, carbon and manganese—should not go. Now it is well known that their hardening effect is by no means equal, and that, therefore, comparisons based upon a simple sum of these hardening constituents is not fair. Dr. Dudley proposes the following relations between them. He assumes 0.01 per cent. of phosphorus as the unit of measurement, and has called this 0.01 per cent. a phosphorus unit. He has likewise assumed that 0.02 per cent. of silicon, 0.03 per cent. of carbon and 0.05 per cent. of manganese have each the same influence in rendering a steel hard and brittle as 0.01 per cent. of phosphorus. In any analysis of steel, therefore, the phosphorus units are found by adding together the phosphorus, one-half the silicon, one-third the carbon and one-fifth the manganese, expressed in hundredths per cent. The total of the phosphorus units is given in the seventh column of the table, from which Dr. Dudley draws the conclusion that in no case the total sum of the phosphorus units should vary far from 30.

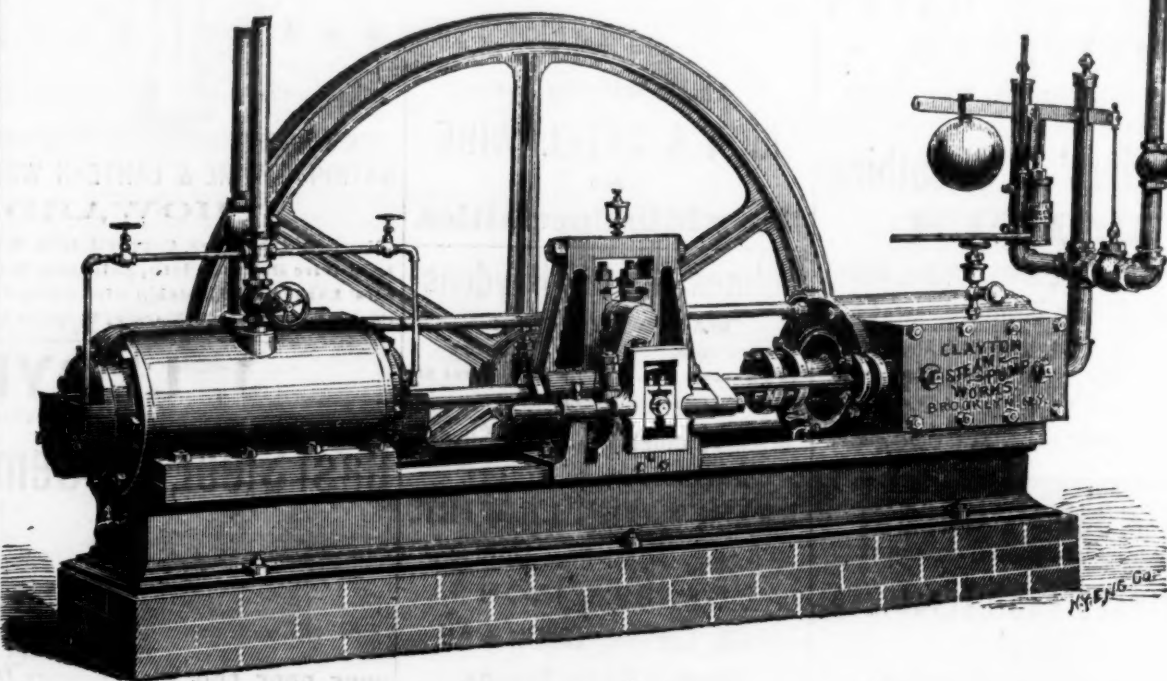
His deductions from the chemical analysis and physical tests (tensile strength given is 94 per cent. of that obtained by Thurston's formula) are: 1. That with our present metallurgical methods high phosphorus in rails is inconsistent with safety. 2. That silicon should be as low as is consistent with the successful working of the Bessemer process. 3. That the best range for carbon is from 0.25 per cent. to 0.35 per cent. 4. That the best range for manganese, all things considered, is from 0.30 per cent. to 0.40 per cent. 5. That the total sum of the hardeners, expressed in phosphorus units in the manner described, should not be above 31 or 32, nor below 25. 6. That the tensile strength of rails for use on the Pennsylvania Railroad, determined by the Thurston torsional machine, should be above 65,000 pounds per square inch, and that the percentage of elongation determined in the same manner should be above 20 per cent.

He prescribes for the chemical composition of rails for the use of the Pennsylvania Railroad the following:

Phosphorus, not above..... 0.10 per cent.  
Silicon, not above..... 0.04 " "  
Carbon, between 0.25 and 0.35 per cent., with an aim at..... 0.30 " "  
Manganese, between 0.30 and 0.40 per cent., with an aim at..... 0.35 " "  
Sulphur and copper..... no specifications.

All other impurities not more than traces. He recommends that the rail manufacturers be requested to procure one of Prof. R. H. Thurston's torsional testing machines, and to furnish test pieces from each "blow," ready for testing, to the rail inspector or other person authorized to attend to that work, who shall test the same on this machine, and that the railroad company shall be at liberty to reject all "blows" which do not conform to the physical tests shown to be essential. Dr. Dudley also recommends the limits to chemical composition given in the above, and that the rail manufacturers be informed that if at any time chemical analysis differs from the specification given, it will be regarded as a breach of contract and a proper subject for adjudication.

The Mexican Minister of Public Works has announced that the Mexican government has decided to hold an exhibition in the city of Mexico at an early day. The exhibition is to be confined exclusively to Mexican and American products.



CLAYTON'S NEW AIR COMPRESSOR, WITH AUTOMATIC PRESSURE GOVERNOR.

cannot blame America for following in her own footsteps. There are certain English staple commodities which even far-seeing and broad-minded politicians say we should protect, even in the present day, and it would not surprise me to see the question of free trade once more on its trial in theory, in fact, and practice before American competition is many years older.

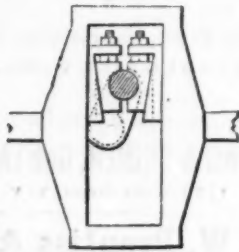
## Workingmen in France.

Land and Water, drawing a contrast between the working people of France and England, suggests that the latter would do well to send out a commission to France and inform itself why the people of the latter are more thrifty and have less pauperism than prevails among the English working classes. The writer proceeds to say:

The French artisan works longer for his weekly earnings than the Englishman. On the average the difference in the number of hours is 27 1/2 per cent., while the wages paid are 25 per cent. lower, so that in these two items together the employer in France has an advantage over an English mill owner of more than 52 per cent. On the other hand, a somewhat greater number of hands have to be employed in France than in England for a similar amount of work, and some classes of English workpeople individually produce more than the same class of French workpeople; but on the whole, after allowing for these considerations, the best authorities agree that labor in France costs one-fourth less than in England; in other words, the earnings of a French operative are 25 per cent. less than those of the British workingman. Then are the French artisans in worse circumstances than the English industrial classes? Quite the contrary.

The most striking fact with regard to the French working classes is that nearly all are possessed of money. However little they earn, they save something. Thrift is their great characteristic; in fact, it is said of the French operatives that they spend less in proportion to their means than any in the world. Many keep their accumulations in an old stocking secreted in their houses; others—a daily increasing number—invest in various securities, the most popular in-

donds from the British funds was 228,696; in 1875 the number of holders of French rentes was 4,380,933. Many artisans in France live in their own freehold houses; others rent small houses, or more commonly, the flat of a larger house. In some districts rent is about the same as in the manufacturing districts in England; in other parts it is much lower. Butchers' meat is a trifle cheaper, but meat is not, as with us, an article of daily consumption. In the South of France, thanks to the climate and soil, fruit is to be had for very little, and wine is abundant and cheap. Clothing is far cheaper, the blue blouse, the invariable working dress, being very useful, suitable and inexpensive. All these are points in



SLOTTED CROSSHEAD, JOURNAL BOXES & GIBS.

favor of the French workingman. But then he is paid 25 per cent. less than the Englishman, and therefore how is it that he is able to save so much more than the British operative?

During various inquiries made of late years into the factory laws, eminent witnesses declared that the physique of our operatives is deteriorating; if so, then the hams, eggs, potatoes, spirits and so forth, in which they more and more indulge, have not been of much use to them. Of course, the great mistake of the English working classes is intemperance; the public house is the sink down which he steadily pours his earnings. In France it is otherwise; French wine, if cheap, is unintoxicating; drunken men are rare, and a drunken woman is seldom seen. But, after all, it may be that the mischievous effects of an ill-administered poor law, operating from generation to



**Metals.****ANSONIA  
BRASS & COPPER CO.,**  
19 and 21 Cliff Street.

Adjoining Office of Phelps Dodge &amp; Co.)

Sheet Brass, Sheet Copper, Copper Bot-  
toms, Brass Wire, Copper Wire.

|  |  |
|--|--|
| Polished Brass,<br>Polished<br>Brass Door Rails,<br>Hayden's Patent<br>Brass Kettles,<br>Brass Tubing,<br>Lamp Burners,<br>San Burners,<br>Seamless Brass & Copper Pipe. | Polished Copper,<br>Copper Rivets & Burs,<br>Braziers' and Bolt<br>Copper,<br>Braziers' Rivets,<br>Copper Tubing,<br>Iron Wire,<br>Fence Wire. |
|--|--|

**THE ANSONIA**Corrugated Stove Platform.  
SEE PAGE 9.**Phelps Dodge & Co.,**

IMPORTERS OF

**TIN PLATE,**Sheet Iron, Copper, Pig Tin, Wire,  
Zinc, etc.

MANUFACTURERS OF

**COPPER and BRASS.**Cliff St., bet. John and Fulton,  
NEW YORK.**SCOVILL MFG CO****BRASS,**

HINGES, WIRE, GERMAN SILVER.

**PHOTOGRAPHIC GOODS.****BUTTONS,  
CLOTH AND METAL.**

|  |  |
|--|--|
| DEPOTS,<br>419 & 421 Broome St., N. Y.<br>112 Federal St., Boston.<br>183 Lake St., Chicago. | FACTORIES,<br>Waterbury, Conn.<br>New Haven, Conn.<br>New York City. |
|--|--|

**DICKERSON, VAN DUSEN & CO.,**

Importers of

Tin Plate, Pig Tin, Sheet Iron, Copper,  
Wire, Zinc, Etc.29 & 31 Cliff St., cor. Fulton,  
DICKERSON & CO., Liverpool, NEW YORK.

JAMES HALL, TREASURER.

**THE**

CHAS. HEWITT, PRESIDENT.

**TRENTON IRON COMPANY,**

(INCORPORATED 1847),

TRENTON, NEW JERSEY,  
MANUFACTURERS OF**IRON and STEEL WIRE**

OF ALL GRADES,

BRIGHT, ANNEALED, COPPERED, TINNED AND GALVANIZED;

Iron and Steel Wire Rods;

EXTRA QUALITIES OF BAR IRON AND RODS.

Best Qualities of Gun-Screw and Charcoal Iron Wire;

Crucible, Siemens-Martin and Bessemer Steel Wire.

Wire Straightened and Cut to Lengths.

Represented in New York by COOPER, HEWITT &amp; CO., 17 Burling Slip.

**BRODERICK & BASCOM,**

MANUFACTURERS OF

|                    |   |                     |
|--------------------|---|---------------------|
| IRON<br>WIRE ROPE. |  | STEEL<br>WIRE ROPE. |
|--------------------|---|---------------------|

800 N. Main St., St. Louis, Mo.

**Kelly Steel Barb Wire.**Pat. 1868, and licensed under all patents  
before it.

A Thorn Wire Hedge.

Stock, Storm and Fire Proof.

**The Cheapest Fencing in the World.**Is adopted by Railroads, by Stock Raisers and by Farmers generally  
throughout the West. One Dealer wanted in each town to act as agent.  
Send for samples and terms.**THORN WIRE HEDGE CO.,**

34 and 36 Canal St. Chicago, Ill.

**WIRE,** ALL KINDS. SEE ADVERTISEMENT, PAGE 6  
GAUTIER STEEL CO., Limited.**Metals.****Waterbury Brass Co.**

CAPITAL, - - \$400,000.

JOHN SHERMAN, Agent,

296 Broadway, - - New York.

Mills at WATERBURY, CONN.

Sheet, Rolled and Platers' Brass,

GERMAN SILVER,

Copper, Brass and German Silver Wire,

BRASS AND COPPER TUBING,

COPPER RIVETS &amp; BURS,

BRASS KETTLES,

WASH BASINS,

Door Rail, Brass Tags &amp; Step Plates.

PERCUSSION CAPS,

POWDER FLASKS,

Metallic Eyelets,

Shot Pouches,

Tape Measures, etc.

**Manhattan Brass Co.,**

Manufacturers of

|   |   |
|---|---|
| Sheet Brass,<br>Brass Wire,<br>Copper Wire,<br>Copper Rivets,<br>Brass Tubing,<br>Spelter Tubing,<br>Copper Rivets, | Oldest Patent Oilers,<br>Prior Patent Oilers,<br>Broughton Patent Oilers,<br>Brass, Tin & Zinc Oilers,<br>Grate Trimmings,<br>Brass Butt Hinges,<br>Hurricane Lanterns. |
|---|---|

**BRASS BLANKS & TUBES**

OF EVERY DESCRIPTION TO ORDER.

Agents for Hartford Eyelet Co.

Office, 83 Rende cor. Church St., N. Y.

Works, 1st Ave., 27 to 28th St., N. Y.

J. H. WHITE, President. H. L. COES, Secretary.

J. H. CRANE, Treasurer.

**THE NEW HAVEN  
COPPER CO.,**

255 Pearl Street, New York.

Manufacturers of and Dealers in

**Braziers' & Sheathing  
COPPER.**

Kettle Bottoms, Bolts, Circles, Rivets,

Ingot Copper, Spelter, Solder, &amp;c

**Metals.****The Plume & Atwood  
Mfg. Company,**

MANUFACTURERS OF

SHEET and ROLL BRASS and WIRE,

German Silver and Gilding Metal,

Copper Rivets and Burs,

Kerosene Burners,

Shoe Eyelets, Lamp Trimmings, &amp;c.

80 Chambers Street, New York.

13 Federal Street, Boston.

Rolling Mill,

Factories,

THOMASTON, CT. WATERBURY, CT.

**Bridgeport Brass Co.,**

MANUFACTURERS OF

Sheet and Roll Brass,

Brass &amp; Copper Wire &amp; Tubing,

German Silver Metal and Wire,

Copper and Iron Rivets.

OILERS and CUSPADORES, LAMPS and TRIMMINGS,

LANTERNS and TRIMMINGS, KEROSENE BURNERS,

CLOCKS and CLOCK MOVEMENTS.

Particular attention paid to cutting out Blanks and  
manufacturing Metal Goods.

MANUFACTORY,

WAREHOUSE,

Bridgeport, Conn. 19 Murray St., N. Y.

**Harrison Wire Company,**

ST. LOUIS, MO.

THOS. W. FITCH,

Pres. and Treas.

CHAS. FISH,

Secretary.

MANUFACTURERS OF

All kinds of

IRON &amp; STEEL WIRE

AND

Wire Mill Specialties.

**Holmes, Booth & Haydens,**

WATERBURY, CONN.

NEW YORK,

BOSTON,

49 Chambers St.

15 Federal St.

Manufacturers of all kinds of

Brass, Copper &amp; German Silver,

ROLLED AND IN SHEETS.

BRASS &amp; COPPER WIRE,

Tubing, Copper Rivets &amp; Burs.

BRASS &amp; IRON

JACK CHAIN, DOOR RAIL.

German Silver Spoons,

SILVER PLATED FORKS &amp; SPOONS,

Kerosene Burners, &amp;c.

**JOHN DAVOL & SONS,**

Agents for

Brooklyn Brass and Copper Co.,

Dealers in

Ingot Copper, Spelter, Lead, Tin,

Antimony, Solder &amp; Old Metals.

100 John Street, N. Y.

**PASSAIC ZINC CO.**

Manufacturers of

**Pure Spelter**

FOR

Cartridge Brass, Gas Fixtures, Bronzes

AND ALL FINE WORK.

Also for

Galvanizers &amp; Brass Founders.

MANNING &amp; SQUIER, Gen'l Agents

113 Liberty Street, N. Y.

**Geo. W. Prentiss & Co.,**

HOLYOKE, MASS.,

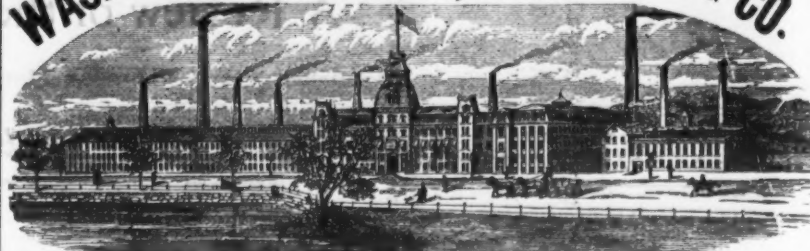
MANUFACTURERS OF

**IRON WIRE.**Bright, Coppered, Annealed and Tin  
Plated. Also GUN SCREW WIRE.  
Of all sizes straightened and cut to order.**R. SELLEW & CO.**

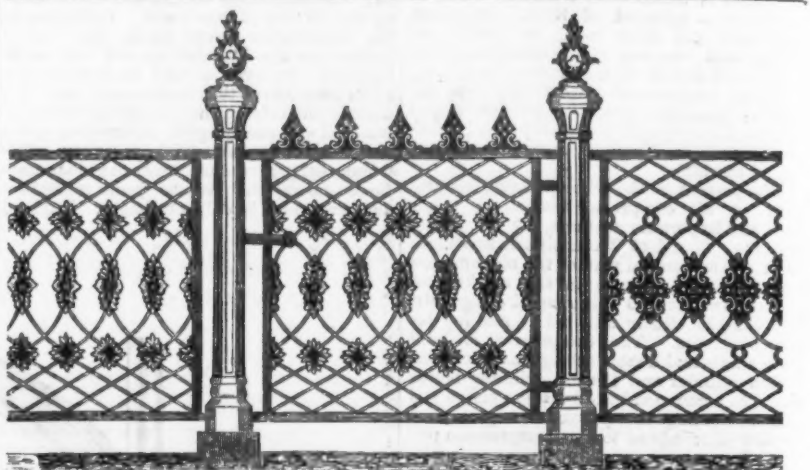
Dealers in METALS,

Tin Plate, Sheet Iron, Copper, &amp;c.

SAINT LOUIS.

**Wire, etc.**PHILIP L. MOEN,  
President & Treasurer.CHAS. F. WASHBURN,  
Vice-President & Sec'y**WASHBURN & MOEN MANUFACTURING CO.**  
Established 1831.  
WORCESTER, MASS.

MANUFACTURERS OF

**Iron and Steel Wire,  
PATENT STEEL BARB FENCING,  
Patent Steel Wire Bale Ties.**WIRE RODS of all Grades: Round Iron, Rivet quality, 3-16 in. to 1 in., cut to any length. Owners and ex-  
clusive Operators of the PATENT CONTINUOUS ROLLING MILL, producing Iron and Steel WIRE, in  
coils of 100 pounds, without SEAM or WELD. Patent Galvanized Telegraph Wire, Market and Stone Wire,  
Annealed Fence and Grape Wire in long lengths: Coppered Rail-Rail Wire: Rope, Bridge, Bolt, Screw, Rivet, Buckle  
and Chain Wire. Wire for the manufacture of Card Clothing, Saddles, Reeds, &c. Piano-string Covering Wire,  
Tinned Broom Wire and Tinned-plate Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and  
Spiral Spring Wire, and Refined Wire to Pattern for particular purposes, from selected stamps of Norway Iron.  
Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished,  
Straightened and Cut to any length. Steel Crapline Wire, Patent Linnen finish. Unriveted Steel Music  
Wire. Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.  
WAREHOUSE, 42 CLIFF STREET, NEW YORK. St. Louis Office, 717 North 2d Street.

NATIONAL WIRE &amp; LANTERN WORKS. Warehouse, 45 Fulton St. N. Y.

**HOWARD & MORSE,**Manufacturers of Brass, Copper & Iron Wire Cloth, Locomotive Spark Wire Cloth,  
Iron Wire Bolting Cloth, Ship and Railroad Lanterns, Signal Lights, Conduc-  
tors' Lantern, Adjustable Globe Hand Lantern, Desk & Office Hanging, Riddles  
Coal & Sand Screens, Nursery Fenders & Spark Guards, Ornamental Wire Fence.**J. LLOYD HAIGH,**

MANUFACTURER OF

**Cast Steel, Bessemer Steel & Iron Wire**

AND

**WIRE ROPE**

OF EVERY DESCRIPTION.

WIRE ROPE FOR Mines, Elevators, Inclined Planes, Derricks, Stays, Ship Rigging,  
Sash Cord, GALVANIZED WIRE CLOTHES LINES.

SUSPENSION BRIDGE CABLES.

WIRE. Bright, Coppered, Annealed, Tinned, Retic, Spring, Machinery, Chain,  
Buckle, &c.

Also Fence and Vineyard Wire.

Galvanized Steel Barb FENCING WIRE, Plain and twisted, and Staples.

Galvanized Telegraph Wire, Patent Tempered Cast Steel Furniture Springs.

WORKS—South Brooklyn. OFFICES—81 John St., New York.

**IRON AND STEEL WIRE ROPE**

For Hoisting, Running &amp; Standing Ropes, Ferries, &amp;c.

CONSTANTLY KEPT ON HAND.

Address, HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.

WORKS

**ROEBLING'S**

AT

TRENTON,

N. J.

**WIRE ROPE**

New York Office

AND

Warehouse

AT

117 Liberty Street.

**THE JOHN A. ROEBLING'S SONS CO.,**

MANUFACTURERS OF

**WIRE ROPE**

OF

Iron, Steel and Copper,

FOR

Hoisting Purposes of all

kinds, for Ferries, Stays,

Ship Rigging, Sash Cords,

Lightning Rods, &amp;c., &amp;c.

Suspension Bridge Cables.

GALVANIZED

Telegraph Wire,

Market Wire,

Vineyard Wire.

**Iron and Steel**

WIRE

FOR

Market Wire, Fence Wire,

Bridge Wire, Chain Wire,

Buckle Wire, Spring Wire,

Rivet Wire, &amp;c., &amp;c.

GALVANIZED WIRE CLOTHES LINES.

**TROY WIRE COMPANY,**

Troy, N. Y.,

Manufacturers of

J. WOOL GRISWOLD,

**IRON AND STEEL WIRE,**Market Wire, Fence Wire, Ball Wire, &c. Wire Straightened and  
Cut to Lengths.



**O. LINDEMANN & CO.**

Manufacturers of  
Japanned, Brass and  
Silver Plated

**Bird Cages.**

Original inventors  
of

**Bright Metal  
Cages,**

Constructed without  
solder.

254 Pearl St.,  
NEW YORK.

Our cages can be  
nested for shipping.



**John Maxheimer,**

Manufacturer of  
Patented

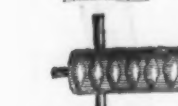
Japanned, Tinned  
Wire,

First and Second-  
Class Brass

**Bird Cages.**

Wires on both classes  
fastened without solder.

247 & 249 Pearl St.,  
New York.



Full Size of Second Class Brass.

**THE WORCESTER WIRE CO.,**

Cambridge St., Worcester, Mass.

MANUFACTURERS OF

**IRON AND STEEL WIRE**

OF EVERY SIZE AND GRADE.

Classification List mailed on application.



**Extra Large Iron Roller,**

Nickel Plated. Two Heaters.

**Shepard Hardware Co.**

(Successors to JNO. D. SHEPARD.)

MANUFACTURERS.

Send for Catalogue. BUFFALO, N. Y.



**RAIL-ROAD LANTERN.**



This Lantern is specially constructed for Rail  
Road purposes and general use where a heavy  
lantern is wanted. It has hinge top and re-  
movable globe, and constructed with first-class  
workmanship. Send for Price-List.

N. DUBBELL & CO., Lantern Manuf'rs,  
441 & 443 Plum Street, CINCINNATI, O.

**THE**

**Gilbert & Bennett Mfg. Co.,**

GEORGETOWN, CONN.,

MANUFACTURERS OF

**IRON WIRE, SIEVES AND**

**WIRE CLOTH,**

Power Loom Painted Screen Wire Cloth,

GILBERT'S RIVAL ASH SIEVE,

Galvanized Twist Wire Netting,

THE UNION METALLIC CLOTHES LINE WIRE,

Warehouse, - 273 Pearl St., New York.

**S. L. SAMUEL,**

Hardware Manufacturers' Agent

**For EXPORT.**

Advances made on consignments.

No. 57 Cedar Street, - NEW YORK.

**Stove Repairs.**

Repairs for Stoves made at Troy, Albany, Rochester

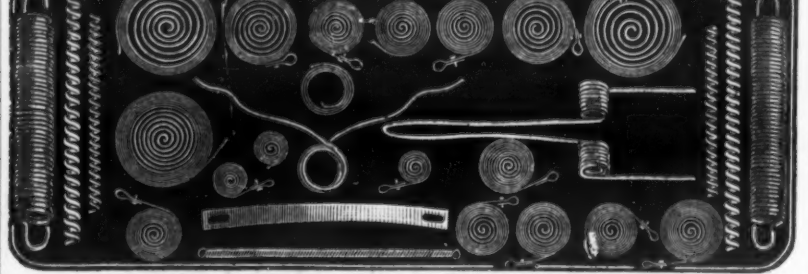
Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago

Milwaukee and elsewhere, at

W. C. METZNER,  
177 W. Randolph St., Chicago, Ill.

**CARY & MOEN,**  
Manufacturers of

STEEL WIRE for all purposes and STEEL SPRINGS of every description.



Market Steel Wire, Crinoline Wire, tempered and covered.

Also Patent Tempered Steel Furniture Springs, constantly on hand.

234, 236 and 238 West 29th Street, NEW YORK.

**THE PERFECTION STOVE PIPE.**

(PATENTED)

**Reduction in Price.**

Our large production of this article enables us to

reduce prices, as will be noted below. This Pipe is

rapidly gaining in favor and must eventually super-

cede the old style entirely. Made wholly by ma-

chinery, every joint is exactly alike, and all fit to-

gether with perfect accuracy. A child can adjust it,

no tools being required. It is indispensable in the

household on this account. Fifty joints of 5

inch pipe can be packed in a case 10

inches square by 24 inches long inside, thus

occupying hardly more room than Tin Plate, and

securing the lowest rates of freight. The fol-

lowing are net cash prices, no charge for cases: 5

in., per joint, 10c.; 6 in., per joint, 12c. Other sizes

in proportion.

SOLE MANUFACTURERS,

**THE CHICAGO STAMPING CO.,**

Nos. 10, 12 & 14 Lake St., Chicago.

For sale in New York by E. KETCHAM & CO., 100 Beekman St.

ESTABLISHED IN 1848.

**SINGER, NIMICK & CO.,**

PITTSBURGH, PA.

MANUFACTURERS OF ALL KINDS OF

**HAMMERED AND ROLLED**

**STEEL,**

Warranted Equal to any Produced.

**BEST REFINED TOOL CAST STEEL**

For Edge and Tinning Tools, Taps, Dies, Drills, Punches, Shear-Knives,

Cold-Chisels and Machinists' Tools generally.

**SAW PLATES**

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

**Sheet Steel**

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,

Stamping Cold, &c., &c.

**SIEMENS-MARTIN (Open-Hearth) PLATE STEEL**

For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface

finish and exactness of gauge.

**ROUND MACHINERY CAST STEEL**

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calks, Sleigh-Shoes and Tire Steel, &c.;

Cast and German Spring and Flow Steel.

"Iron Center" Cast Flow Steel. Finished Rolling Plow Coulters with Patent Screw

"Soft Steel Center" Cast Flow Steel. Hubs attached.

"Solid Soft Center" Cast Flow Steel. Agricultural Steel cut to any pattern desired.

Steel Forgings made to order.

Represented at 59 BECKMAN ST., NEW YORK, by

HOGAN & BURROWS, Gen'l Agents for Eastern and New England States.

ESTABLISHED 1810.

N. & G. TAYLOR CO., Philadelphia.

Wholesale and Retail Dealers, by the single sheet or by the full case, in all kinds of

**TIN PLATE FOR DAIRY APPARATUS.**

A specialty of sizes for Cheese Vats, Milk Pans, Butter and Cream Vats, Cream Evaporators,

Milk Servers, Cheese Hoops, Cream Kettles, Ice Cans, Cotton Cans, Cream Cans, &c.

We call attention to the unexceptionable facilities we have for the production of large and odd

size sheets of Tin Plates. We can supply, if not directly from stock, any size or thickness of

Tin, from the very smallest to the largest sheet made.

Also intermediate sizes in immense variety. No. 6 to No. 40 wire gauge.

The trade is therefore not compelled to buy from other parties an unsatisfactory size that

cuts to waste when we can give them the exact size wanted. N. & G. TAYLOR CO., Philadelphia.

**THE CELEBRATED DECOY TRAP.**

E. C. QUINBY, President.

**ENAMELED IRON KITCHEN WARE.**

PATENTED.

J. C. WHITING, Secretary.

Every description of Wire Cloth, Wire Window

Guards, Bank and Office Railing, Moulders'

Riddles, Decoy Rat and Mouse Traps,

Wood and Metallic Flour and Meal

Sieves, Dish Covers, &c.,

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.

STONE-IRON WARE

At the Lowest Prices.

Made only by the

**Metal Stamping & Enameling Company,**

OFFICE & FACTORY, 705, 710, 712 N. Second St., St. Louis, Mo.

FRANK & SONS, 100 Chambers St., New York Agents.</



**Iron.**  
NEW YORK.  
**OGDEN & WALLACE,**  
Successors to GAM'L G. SMITH & CO.,  
**IRON & STEEL,**  
85, 87, 89 & 91 ELM ST., N. Y.  
**COMMON AND REFINED  
BAR IRON.**  
SHEET AND PLATE IRON,  
HOOP, BAND AND SCROLL IRON,  
Rod and Horse Shoe Iron,  
Angle and T Iron,  
wedges and Norway Iron, Norway Nail Rods.  
Iron of all sizes and shapes made to order.

**PIERSON & CO.,**  
Established 1790,  
24 & 26 Broadway, 77 & 79 New St.  
NEW YORK CITY,

**Ulster Iron.**  
All Sizes and Shapes kept in Stock.

**J. H. JACKSON & CO.,**  
206 & 208 Franklin St., N. Y.  
Importers and Dealers in

**IRON and STEEL.**  
Agents for  
JOHN A. GRISWOLD & CO'S  
Bessemer Steel.  
MACHINERY STEEL,  
Cast Steel and  
SPRING STEEL,  
ANGLE and T IRON.  
Special Irons for Bridge and  
Architectural Work.

**ABEEL BROTHERS,**  
Established 1785 by ABEEL & BYVANCK,  
**Iron Merchants,**  
190 South Street and 365 Water, N. Y.  
**ULSTER IRON**

A full assortment of all sizes constantly on hand.  
Refined Iron,  
Horse-Shoe Iron,  
Common Iron.  
Head, Hoop and Scroll Iron.  
Sheet Iron.  
Norway Nail Rods.  
Norway Shores.  
Cast, Spring and Tire Steel, etc.

**A. R. Whitney,**  
Manufacturer of and Dealer in

**IRON,**

16, 58 & 60 Hudson,  
18, 50 & 52 Thomas, and  
12, 14 & 16 West Sts., } **NEW YORK.**

Our specialty is in  
Manufacturing Iron Used in the Con-  
struction of Fire-Proof Buildings,  
Bridges, &c.

Plans and estimates furnished, and contracts made  
for erecting Iron Structures of every description.  
Books containing cuts of all Iron made sent on ap-  
plication by mail. Please address  
58 Hudson Street.

**BORDEN & LOVELL,**  
**Commission Merchants**

70 & 71 West St.,  
New York.

Agents for the sale of

Fall River Iron Co.'s Nails,  
Bands, Hoops & Rods.

AND  
Borden Mining Company's  
Cumberland Coals.

**WILLIAM H. WALLACE & CO.,**  
**IRON MERCHANTS**  
Cor. Albany & Washington Sts.,  
NEW YORK CITY.

WM. H. WALLACE. WM. BISPHAM.

**DANIEL F. COONEY,**  
(Late of and Successor to JAS. H. HOLDANE & CO.)  
88 Washington St., N. Y.

**BOILER PLATES and SHEET IRON,**  
LAP WELDED BOILER PLATES.  
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.  
Agency for Pittsburgh Iron Co., Vindicator Iron Works,  
Lebanon Rolling Mills, Pine Iron Works, Laurel Iron  
Works, The Bergen Rolling Mills, at Jersey City.

**OXFORD IRON CO.,**  
**Cut Nails and Spikes,**  
R. R. Spikes, Splice Bars and  
Nuts and Bolts,  
93 & 95 Washington, near Rector St., N. Y.  
**JAMES S. SORANTON, Agent.**

**Iron.**  
NEW YORK.  
**G. HUERSTEL,**  
**IRON and STEEL,**  
Warehouse, 99 Market Slip, N. Y.  
Sole Agent for Sweet's Toe Calks.  
Constantly on hand, Refined and Common Iron, Horse  
Shoe Iron and Nails, Norway Iron, Cast, Spring,  
Toe Calk and Bessemer Steel Tire.  
Also **SPRINGS, AXLES and BOLTS.**  
For Truck and Carriage Makers.

**A. B. Warner & Son,**  
**IRON MERCHANTS,**  
28 & 29 West and 52 Washington Sts.  
**BOILER PLATE,**

Boiler Tubes, Angle, Tee & Girder Iron,  
Boiler and Tank Rivets.

Sole Agents for the celebrated  
"Eureka," Pennocks,  
"Wawasset," Lukens,  
Brands of Iron. Also all descriptions of Plate, Sheet,  
and Ussometer Iron. Special attention to Locomotive  
Iron. Fire Box Iron a specialty.

**Powerville Rolling Mill**  
**J. LEONARD,**  
OFFICE & YARD, 450 & 451 West Street,  
Cor. Bank Street, NEW YORK.

**HORSE SHOE IRON,**  
Toe Calk Steel, Charcoal Scrap Blooms,  
And Dealer in Scrap Iron.  
Rehoboth Furnace, Iron Station, N. C.  
COLD BLAST CHARCOAL PIG IRON.

**ROME MERCHANT IRON MILLS,**  
ROME, N. Y.,  
Manufacturers of the best grade of  
Bar Iron, Bands and Fine Hoops.  
Scrolls, Ovals, Half Rods, Hexagon and  
Horse Shoe Iron. Also from Charcoal Pig a superior  
quality of iron branded J. G. All puddled balls re-  
duced by hammer. Orders may be sent to the Mill or  
to J. O. CARPENTER, our Agent, at 39 John Street,  
New York.

**MARSHALL LEFFERTS,**  
90 Beekman St., New York City,  
MANUFACTURER AND DEALER.

**Galvanized Sheet Iron,**  
1st and 2d Qualities.

Galvanized Wire, Telegraph and Fence; Galvanized  
Hoop and Band Iron, Galvanized Rod and Bar Iron,  
Galvanized Nails, Galvanized Chains, Galvanized Iron  
Pipe.

**CORRUGATED SHEET IRON**

For Roofing, &c., Galvanized, Plain or Painted.

Best Charcoal, Best Refined and Common  
**SHEET IRON.**

**Plate and Tank Iron,**  
C No. 1, C H No. 1, C H No. 1 Flange, Best Flange,  
Best Flange Fire Box, Circles.

**BOILER IRON**  
Stamped and Guaranteed.

All descriptions of Iron Work Galvanized or  
Tinned to order.  
Price list and quotations sent upon application.

**C. Striffler,**  
**IRON AND STEEL,**  
630 & 632 Ninth Ave., New York.

Carriage and Wagon Materials, Springs,  
Axles, Philadelphia and Eastern  
Bolts, &c., and  
ALL KINDS OF WOOD FINDINGS.

**JAMES WILLIAMSON & CO.,**  
SCOTCH AND AMERICAN

**PIG IRON,**  
No. 69 Wall St., New York.

**A. PURVES & SON,**  
Corner South & Penn Streets, Phila.,  
Dealers in

Scrap Iron & Metals, Machinery, Tools,  
Shafting & Pulleys, Steam Engines,  
Pumps & Rollers, Copper, Brass,  
Tin, Babbit Metals, Foundry  
Facings. Best Quality Ingot Brass.  
Cash paid for all kinds of Metals and Tools.

**IRON**

**Bonnell, Botsford & Co.,**  
**Iron, Nails & Spikes.**  
YOUNGSTOWN, OHIO.

**IRON**

**Iron.**  
NEW YORK.  
**John W. Quincy,**  
98 William Street, New York.  
**Anthracite & Charcoal Pig Irons,**  
Wrought Scrap, Cut Nails, Copper,  
BLOCK TIN, LEAD, SELLER, ANTIMONY, NICKEL, &c.

**HARRISON & GILLOON**  
**IRON and METAL DEALERS,**  
556, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST.,  
NEW YORK.

have on hand, and offer for sale, the following:  
Scotch and American Pig Iron, Wrought, Cast and  
Machinery Scrap Iron, Car-Wheels, Axles and Heavy  
Wrought Iron; also old Copper, Composition, Brass,  
Lead, Pewter, Zinc, &c.

**BURDEN'S**  
**HORSE SHOES.**

"Burden Best"  
Iron

**Boiler Rivets.**

Burden Iron Works, H. Burden & Sons,  
Troy, N. Y.

**B. F. JUDSON,**  
Importer of and Dealer in

**SCOTCH AND AMERICAN**  
**Pig Iron,**

Wrought & Cast Scrap Iron,  
**OLD METALS.**

457 & 459 Water St.,  
933 & 235 South St., } **NEW YORK.**

**Passaic Rolling Mill Co.,**  
PATERSON, N. J.

**Iron Bridge Builders**

And Manufacturers of

Beams, Channels, Angles,  
**TEES,**

Merchant Iron, &c., &c.

New York Office, 138 Chambers Street.

**W. O. COOKE, President.**  
**W. O. FAYEWEATHER, Treasurer.**

**P. W. GALLAUDET,**  
Banker and Note Broker,  
Nos. 3 and 5 Wall Street,  
NEW YORK.

HARDWARE, METAL, IRON, RUBBER, SHOE,  
PAPER AND PAPER-HANGINGS, LUMBER, COAL  
AND RAILROAD PAPER WANTED.  
ADVANCES MADE ON BUSINESS PAPER AND  
OTHER SECURITIES.

**Geo. A. Boynton**  
**BROKER IN IRON**  
70 WALL ST., N. Y.

**W. J. Carmichael,**  
DEALER IN

**Iron & Steel Boiler Plate.**

Lap Welded Boiler Tubes, &c., &c.

130 & 132 Cedar Street, New York.  
Agent for Otis' celebrated Cast Steel Boiler Plates.

**HOUDLETTE & ELLIS,**  
19 Battery March Street, - Boston, Mass.,

MANUFACTURERS' AGENTS AND DEALERS IN

**Homogeneous Steel and Iron Boiler Plates,**

SHEET and TANK IRON—BOILER, TANK and SAFE RIVETS,

Best Lap-Welded Iron Boiler Tubes.

Wrought Iron Girder, Deck & Channel Beams,  
Angle, T and Grooved Iron,

"WALKER'S" FORGED AND HAMMERED HORSE SHOES.

FRED. A. HOUDLETTE,  
Formerly with Bay State Iron Co.

**Wm. B. Ellis,**  
Treas. Boston Rolling Mill

**Spooner & Collins,**  
COMMISSION AGENTS,  
**PIG IRON**

Blooms, Bar, Sheet & Hoop Iron.  
217 N. Third St., St. Louis.

**Iron.**  
PITTSBURGH.  
**W. D. WOOD & CO'S**



**PATENT**  
**Planished Sheet Iron.**

Patented March 14th, 1865; April 8th, 1873;  
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876

Guaranteed fully equal in all respects to the

**IMPORTED RUSSIA IRON,**  
and at a much less price.

**FOR SALE,**  
by all the principal

**METAL DEALERS**

In the Large cities throughout

**THE UNITED STATES.**

And at their Office,  
111 Water Street, PITTSBURGH, PA.

H. E. COLLIER, JAS. H. MURDOCK.

**H. E. COLLINS & CO.,**  
BROKERS IN

**Manufactured**

**IRON, NAILS**

AND

**STEEL,**

Pig Iron, Iron and Steel Rails,

**METALS,**

Railway Supplies, Old Rails and Railway Scrap,  
PITTSBURGH, PA.

Agency of N. M. HÖGLUND, Stockholm.

**Swedish & Norway Iron**

of every description. Stock on hand at Boston,  
New York and Philadelphia. Importation orders a  
specialty.

**GUSTAF LUNDBERG,**  
(Successor to NILS MITANDER) 38 Kilby St., Boston.

**ALBERT FOTTS,** Philadelphia Agent, 234 & 236 N  
Front Street.

**ZUC & CO.,**  
Pittsburgh, Pa.,

Manufacturers of

**Wheeler's Iron & Steel Combination Shafting,**

Under license of the Combination Trust Co., Philadelphia.

This Shafting is superior to any new on the market, and the attention of machinists is  
particularly called to it and a trial order solicited. Prices furnished on application.

**LEECHBURG IRON WORKS.**  
KIRKPATRICK, BEALE & CO.

Manufacturers of all grades of

**FINE SHEET IRONS,**  
(Refined, Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel.)

**TIN AND TERN PLATES,** made with Natural Gas as fuel.

OFFICE, No. 116 Water St., Pittsburgh, Pa. WORKS, Leechburg, Pa.

**YALE "PITCH" [OR "GAUGE"]**

**CHAIN.**

Made of the finest Norway iron, by a patented process which insures perfect ac-  
curacy in the size or "pitch" of the links.

Adapted for transmission of power and for all purposes where perfectly accurate  
chain is required.

**YALE LOCK MFG. CO.,**

Stamford, Conn., U. S. A.

NEW YORK SALESROOM, - - - 53 Chambers St.

Send for circular.

**ZUCKER & LEVETT,**

**NICKEL PLATERS'**

**SUPPLIES.**

Estimates for Complete Outfits Furnished.

639 & 641 West 51st Street, New York,

**Iron.**  
PITTSBURGH.  
A. G. HATRY. PORTER C. FRIEND.  
**HATRY & FRIEND,**  
**Commission Merchants**  
AND DEALERS IN  
Bar, Sheet, Tank, Boiler, Angle, T,  
and Railroad Iron,  
Nails & Spikes, Steel & R. R. Supplies,  
WINDOW GLASS, GAS PIPE & BORAX.  
PITTSBURGH, PA.

**JUNIATA**



**SNOW SHOES.**

The only Snow Shoes in the market that abso-  
lutely prevent all balling and give universal satis-  
faction.

Improved Snow Shoe Shapes.  
Standard Sizes.

5/8x7-16, 11-16x7-16, 3/4x7-16, 13-16x7-16, 7/8x7-16, 15-16x7-16,  
15-16x8, 13/16, 1 1/16x8, 1 1/8x8.

**STEEL TOE CALKS.**  
**SHOENBERGER & CO.,** Pittsburgh, Pa.

JOHN COYNE. A. G. HATRY.

**COYNE & HATRY,**

Patentees and Manufacturers of

**Automatic Nail Selectors,**

**IMPROVED CUT NAIL MACHINES,**

And Nail Factory Supplies.

WORKS, cor. 20th & Mulberry Sts.,  
OFFICE, No. 114 & 115 Water St., Pittsburgh, Pa.



## Iron.

PHILADELPHIA.

**Siemens' Regenerative  
GAS FURNACE.**  
**RICHMOND & POTTS,**  
1198 Fourth St., PHILADELPHIA, PA.

## Iron.

PHILADELPHIA.

**LEVIS & KIMBALL,**  
Manufacturers' Agents  
For Iron and Steel Rails, Car Wheels, Boiler and  
Sheet Iron and General Railway  
Equipment.  
Old Rails, Axles, and Wheels bought and sold.  
261 S. 4th St., Philadelphia.

## Iron.

PHILADELPHIA.

**Edward J. Etting,**  
IRON BROKER AND COMMISSION MERCHANT  
230 S. Third St., Philadelphia, Pa.  
CENTRAL IRON WORKS, - Harrisburgh, Pa.  
**Boiler Plate, Tank Iron, &c.,**  
**PIG, BAR AND RAILROAD IRON,**  
**Old Rails, Scrap, &c.**  
STORAGE WHARF & YARD,  
DELAWARE AVENUE ABOVE CALLOWHILL STREET,  
connected by track with railroad.  
Cash advances made on iron.

## The Iron Interests of Ohio.

The following interesting information about the iron industry of Ohio is condensed from the forthcoming report of Hon. W. J. Walls, State Commissioner of Labor Statistics:

**THE FIRST BLAST FURNACE IN OHIO**  
was built by David Heaton and his brother James in the year 1804. It was located on Yellow Creek, Poland township, Mahoning county. The second blast furnace built in the State was by Robert Montgomery and John Struthers, on the same stream, about three-fourths of a mile from its mouth. This was in the year 1806. The Heaton Furnace went out of blast about the time the Montgomery and Struthers Furnace went into blast, and was never started up again permanently, but the second furnace was worked with considerable regularity until 1812, when its employees were all drafted, and the furnace never started up again.

## THE START IN THE MUSKINGUM VALLEY.

In 1808 a furnace was erected in Muskingum county, four miles west of Zanesville, on Licking Creek. It was built by Moses Diller, with a capacity of about one ton per day.  
In 1811 a furnace was erected in Adams county, known as the Brush Creek Furnace, which was yet in operation in 1837, when Prof. Mathers was making a geological survey of the State, and he relates that at that date, with 12 employees, it had made, in 110 days, 200 tons of iron. Two other furnaces were erected in Adams county—one known as the Marble Furnace and the other as the Steam Furnace, the latter supposed to have been erected about 1814, and called the Steam Furnace because it was the first to use steam in making blast. The last attempt to make iron in Adams county was about the year 1850, by a gentleman now a resident of Cincinnati. The attempt was not a financial success, and was abandoned.

## THE HANGING ROCK REGION.

The first furnace built in the Hanging Rock region was in 1818, in Greenup county, Kentucky. Its capacity was one ton per day. Its stack was 25 feet in height and the diameter of bush six feet, with open top and cold blast.  
On the Ohio side the first built was the Union Furnace, in Lawrence county, in 1826. It was owned by James Rodgers & Co.

The next was built in Scioto county in 1827, by Daniel Young and others, and was known as the Franklin Furnace, its capacity being seven tons per day.  
The oldest furnace in the State prepared to make iron is the Pine Grove, of Lawrence county, owned by Means, Kyle & Co., which was erected in 1829, with an annual capacity of 4500 tons of charcoal iron.

## OFFICIAL TABLES OF AMOUNTS OF IRON MADE.

The following table is prepared to show the growth of the present blast furnace industry of the State. The dates and figures are taken from public records and data prepared by old furnace men:

| Year.     | Stacks erected dur. yr. | Total stacks. | Inc. capacity for yr. | Total capacity at end yr. |
|-----------|-------------------------|---------------|-----------------------|---------------------------|
| 1829..... | 1                       | 1             | 4,500                 | 4,500                     |
| 1830..... | 3                       | 4             | 12,000                | 16,500                    |
| 1831..... | 3                       | 7             | 11,000                | 27,500                    |
| 1832..... | 2                       | 9             | 8,500                 | 36,000                    |
| 1833..... | 1                       | 10            | 4,000                 | 40,000                    |
| 1834..... | 1                       | 11            | 4,500                 | 44,500                    |
| 1835..... | 1                       | 12            | 4,000                 | 48,500                    |
| 1836..... | 2                       | 14            | 11,000                | 59,500                    |
| 1837..... | 3                       | 17            | 24,500                | 84,000                    |
| 1838..... | 1                       | 18            | 4,000                 | 88,000                    |
| 1839..... | 1                       | 19            | 4,000                 | 92,000                    |
| 1840..... | 1                       | 20            | 12,000                | 104,000                   |
| 1841..... | 1                       | 21            | 4,000                 | 108,000                   |
| 1842..... | 2                       | 23            | 8,000                 | 116,000                   |
| 1843..... | 4                       | 27            | 17,000                | 133,000                   |
| 1844..... | 11                      | 38            | 61,500                | 194,500                   |
| 1845..... | 1                       | 39            | 6,000                 | 200,500                   |
| 1846..... | 1                       | 40            | 5,000                 | 205,500                   |
| 1847..... | 3                       | 43            | 30,000                | 235,500                   |
| 1848..... | 3                       | 46            | 30,000                | 265,500                   |
| 1849..... | 1                       | 47            | 10,000                | 275,500                   |
| 1850..... | 1                       | 48            | 6,000                 | 281,500                   |
| 1851..... | 1                       | 49            | 6,000                 | 287,500                   |
| 1852..... | 1                       | 50            | 5,000                 | 292,500                   |
| 1853..... | 2                       | 52            | 14,000                | 306,500                   |
| 1854..... | 2                       | 54            | 11,000                | 317,500                   |
| 1855..... | 5                       | 59            | 52,000                | 369,500                   |
| 1856..... | 3                       | 62            | 30,000                | 399,500                   |
| 1857..... | 4                       | 66            | 41,500                | 441,000                   |
| 1858..... | 7                       | 73            | 33,000                | 474,000                   |
| 1859..... | 6                       | 79            | 80,000                | 554,000                   |
| 1860..... | 3                       | 82            | 34,500                | 588,500                   |
| 1861..... | 3                       | 85            | 43,000                | 631,500                   |
| 1862..... | 5                       | 90            | 43,500                | 675,000                   |
| 1863..... | 3                       | 93            | 34,000                | 709,000                   |
| 1864..... | 11                      | 104           | 95,000                | 804,000                   |

Furnaces not included in the foregoing table were erected in the years 1826, 1827, 1836, 1842, 1846, 1853, 1855 and 1856, a total of nine, all in the Hanging Rock region, all of which have been dismantled.

According to the foregoing table the producing capacity of the blast furnaces of the State is, in round numbers, 900,000 tons annually, while the production has barely equalled half the capacity during the past few years.

## THE ARMY OF IRON-WORKERS.

The following is a list of the persons employed in the several counties at the blast furnaces, as returned by the operators thereof; also giving the number formerly employed at the furnaces now out of blast:

| Counties.       | Present employees. | Former employees. |
|-----------------|--------------------|-------------------|
| Athens.....     | 148                | .....             |
| Belmont.....    | 56                 | .....             |
| Columbiana..... | 490                | 101               |
| Cuyahoga.....   | .....              | 30                |
| Franklin.....   | .....              | 265               |
| Gallia.....     | 112                | 200               |
| Hocking.....    | 1,162              | 429               |
| Jefferson.....  | 78                 | 53                |
| Lawrence.....   | 1,645              | 1,220             |
| Mahoning.....   | 514                | 87                |
| Muskingum.....  | 50                 | 150               |
| Paulding.....   | 565                | 30                |
| Perry.....      | 137                | 450               |
| Scioto.....     | .....              | 95                |
| Stark.....      | 150                | 150               |
| Trumbull.....   | 150                | 100               |
| Tuscarawas..... | .....              | 490               |
| Vinton.....     | .....              | .....             |

This makes the number of present employees aggregate 5160 for the 53 furnaces in operation, and 4015 employees necessary to put in operation the other 56 furnaces that are now out of blast. The 5100 do not represent all the employees, as some of the furnaces purchase their coal and ore, and the producers thereof are not counted by the furnace proprietors in making their returns to the Bureau.

## The History of the Buckle.

As an instance of how large industries have rapidly risen at the bid of capricious fashion to great prosperity, only to collapse suddenly by the whim of one person, we cite the following from the "Great Industries of Great Britain":

The reign of the buckle began about the time of William and Queen Anne, and lasted nearly to the reignty of George the Magnificent. There were shoe buckles, knee buckles, waist buckles, hat buckles, and buckles for a number of other purposes, of infinite variety as to size, fashion and quality. Shoe buckles were most in vogue. Everybody wore them—men, women and children—and the rich vied with each other in wearing those of the newest pattern or device. There was the Flemish fashion, the Spanish fashion, the Italian fashion and many others. The price of a pair of steel shoe buckles might range from a few pence to ten or twelve guineas, and many wore them of gold or silver and had them set with gems. Other trinkets of like character, also made of steel, were in general wear. Purses of fine steel rings, with steel beads and tassels; steel chateaux, bracelets, brooches and watch chains; dress swords, with saw-pierced steel hilt and scabbard mounts; steel latches, clasps and buttons; steel fringes, and an infinite variety of other ornamental articles, were conspicuous in the attire of every person of fashion, and formed the principal attraction of the shop windows. These were all comprehended under the generic term of "steel toys," a name which enabled Burke to fix upon Birmingham the title of "Toysshop of Europe." The word "toy" is now associated chiefly with children's playthings, but at that time it had the wider definition assigned to it in an old dictionary in the possession of the writer—"a trifle, a nick-nack, a fangle, a gaud." From Birmingham these gauds found their way to France, Germany, Italy, Spain, the Low Countries, and even to America. It was computed that at one time a third of the inhabitants of Birmingham were engaged in making buckles alone; and all the little hardware towns round about were helping in the manufacture. Walsall made only the "chapes" or tongues; other towns produced separate parts. The value of all these toys consisted mainly in the workmanship bestowed upon them, and thus was fostered a handicraft skill and delicacy which have never since deserted the fingers of the Birmingham artisan. It was at the height of this mania that Matthew Bolton came upon the scene, took up the trade with others, at his famous factory of Soho, and, as was usual with everything he touched, made it his own. Bolton's steel buttons, cut with facets, sold for as much as 140 guineas the gross. The prices obtained for such things were indeed enormous, as the following paragraph from an old print will show: "1777. January 18. Was kept at court as her Majesty's birthday. The ball was splendid and numerous, and the dresses rich as had ever been seen on any like occasion. One lady appeared with a button of steel to loop up her train which cost 110 guineas." Of course while this lasted it was high-carnival time with the workmen of Birmingham, but they were to learn from bitter experience a lesson which has since been repeated many times in their history—how unstable is a trade which depends on fashion. The Prince of Wales appeared at a State ball in 1795 wearing shoe strings! From that moment the trade was doomed. Amid general ridicule, mingled with bitter scorn and invective the effeminate innovation, as it was then regarded, gained ground, and the buckle trade collapsed. Great distress followed, accompanied by frequent disturbances. The wearers of shoe-strings were hooted and pelted in the streets. "I remember," writes an octogenarian, "that a party of the buckle makers, having nothing else to do, hired a donkey, and led the animal about the streets with shoe strings tied about its hoofs, to ridicule the new fashion and to amuse charity at the same time." The change in public taste extended to the other "fangles and gauds" which had so long been the rage, and utter ruin seemed to have fallen on the town.

**The Channel Tunnel.**—The site of the tunnel mouth of the Channel Tunnel on the English side, at St. Margaret's Bay, has been abandoned and the work there has been stopped because recent surveys between that point and Sangatte on the French side proved that to cut a tunnel between those points would entail an enormous amount of work in sinking. The scheme now before the company provides for the sinking of a new shaft at or close to Dover. The site on the French side at Sangatte, near Boulogne, is still looked upon as the best that could be chosen for the commencement of the tunnel. The shaft sunk there is already 70 meters in depth, with a diameter of 2 meters, and the engineers consider that when they have got 10 meters further down the horizontal cutting may be commenced. The engineers of both countries agree that the French opening of the tunnel is the most difficult part of the undertaking, as a clayey soil has to be dealt with instead of chalk, and the incursion of water causes much trouble.

**A New Cunarder.**—A magnificent screw steamer, the latest addition to the fleet owned by the Cunard Company, was launched Nov. 12 from the shipbuilding yard of Messrs. James and George Thomson, Glasgow. The vessel was named the Gallia by the Marchioness of Ailsa. The dimensions of the Gallia are as follows: Length over all, 450 feet; breadth, 41 feet; depth, 36 feet; tonnage, 5200; engines, three cylinders, compound direct-acting; diameter of cylinders, one of 61 inches and two of 54 inches each; stroke of piston, 60 inches; horse-power, 700. Mr. John Burns said that the Gallia was the 165th steamship which had been built for his firm, whose fleet since its commencement aggregated upward of 180,000 tons of steam shipping, propelled by 50,000 horse-power, and that no steamship of that great fleet had more thought or care bestowed upon her construction than the ship which they had just launched. The propeller blades are of steel, made by Messrs. John Brown & Co., Limited, Sheffield.

**The Cambria Iron and Steel Works,**  
Having enjoyed for over TWENTY YEARS the reputation of producing the best quality of  
**RAILS,**  
have now an annual capacity of  
**100,000 Tons of Iron and Steel Rails, Splice Bars, &c.**  
ADDRESS,  
**CAMBRIA IRON COMPANY,**  
No. 218 South 4th Street, Philadelphia.  
Or at the Works, **JOHNSTOWN, PA.**  
Or J. S. KENNEDY & CO., New York Selling Agency, 41 Cedar St., N. Y.

**THE PHOENIX IRON CO.,**  
410 Walnut Street, PHILADELPHIA.  
Manufacturers of  
**CURVED, STRAIGHT AND HIPPED**  
**Wrought Iron Roof Trusses, Beams, Girders & Joists.**  
and all kinds of Iron Framing used in the construction of Iron Roof Buildings.  
**DECK BEAMS, CHANNEL, ANGLE AND T BARS**  
curved to resemble, largely used in the construction of Iron Vessels.  
**PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,**  
for Top and Bottom Chords of Bridges.  
**Railroad Iron, Street Rails, Rail Joints and Wrought Iron Chairs.**  
**REFINED BAR, SHAFING, and every variety of SHAPE IRON made to Order.**  
Plans and Specifications furnished. Address,  
**SAMUEL J. REEVES, President.**

**The Standard Steel Works.**  
**LOCOMOTIVE AND CAR WHEEL TIRES,**  
Manufactured from the celebrated OTIS STEEL.  
**BRAND**  
**STANDARD.**  
Quality and efficiency fully guaranteed. Prices as low as any of the same quality.  
We manufacture  
Heavy and Light Forgings, Driving and Car Axles, Crank Pins, Piston Rods, Etc.  
Works at Lewistown, Pa. Office, 220 S. 4th St., Philadelphia, Pa.

**ALAN WOOD & CO.,**  
MANUFACTURERS OF  
Patent Plinished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom  
**PLATE & SHEET IRON,**  
No. 519 Arch St., Philadelphia, Pa.  
Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack, Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

**JAS. ROWLAND & CO.,**  
Kensington Iron, Steel & Nail Works,  
920 North Delaware Ave., - - PHILADELPHIA,  
Manufacturers of the  
**Anvil Brand Refined Merchant Bar Iron.**  
Also, the James Rowland & Co. Kensington Nails, cut from their  
Refined Anvil stock. Also, Plow and Cultivator Steel, Rounds,  
Squares, Flats, Bands and Hoop Iron.  
Correspondence with Dealers solicited.

**PENCOYD IRON WORKS.**  
**A. & P. ROBERTS & CO.,**  
Manufacturers of  
**CAR AXLES.**  
**BAR, ANGLE, TEE AND CHANNEL IRON.**  
Office, No. 265 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

**FOUNDRY FACINGS.**  
**MANUFACTURERS' FOUNDRY SUPPLIES.**  
**MOULDING SAND**  
**GERMAN LEAD, BITUMEN, SIEVES, MACHINERY SAND,**  
**AMERICAN LEAD, ANTHRACITE, SHOVELS, BRASS**  
**GRAPHITE, CHARCOAL, BRUSHES, CHANDELIER**  
**PLUMBAGO, MINERAL, CRUCIBLES, STOVE PLATE**  
**J. W. PAXSON & CO.,** OFFICE & STOREROOMS,  
514, 516 and 518 Beach St., Philadelphia, Pa.

**"AMERICAN HURDLE FENCE."**  
Trade Mark.  
**IRON POST AND RAIL FENCE, \$1.20 to \$1.80 per panel.**  
**IRON PICKET FENCE, 40 to 50 cents per foot.**  
Send for circular. See illustration in The Iron Age, page 18, October 31, 1878.  
MANUFACTURER AND PATENTEE,  
**J. B. WICKERSHAM, 913 Cherry St., Philadelphia,**

**D. W. R. READ & CO.,**  
General Commission Merchants,  
**ORES, METALS, &c.**  
Spanish, Algerian and Domestic Ores of  
Iron, Manganese, &c.  
205½ Walnut St., PHILADELPHIA.

**Chester Iron Company's  
BESSEMER ORES**  
RECENT DETERMINATIONS.  
Metallic Iron, 56.65 48.56 55.75 60.62 50.44 58.43 55.53  
Phosphorus, 0.0067 0.0055 0.0037 0.0009 0.007 0.038 0.0021  
Price REDUCED from Oct. 15th to \$2.25 f. o. b. Hacklebarney.  
**J. WESLEY PULLMAN, Treasurer,**  
407 Walnut St., Philadelphia.

**UNION FORGE AND IRON MILLS.**  
**Wilson, Walker & Co.,**  
Pittsburgh, Pa.  
Manufacturers  
**UNIVERSAL MILL PLATES**  
For Bridges, Pipes, &c.  
SHAFTING, DRAWBAR IRON, MERCHANT BAR  
IRON, &c., &c. Also  
**HEAVY AND LIGHT FORGINGS**  
Of all kinds  
FOR CARS, LOCOMOTIVES AND ENGINES,  
Including Drawbars, Axles (either hammered or  
rolled), Driving Axles, Locomotive Frames, Steamboat  
Shafts, Cranks, Propeller Frames, Oil Tool Forgings  
&c. &c.

**The U. S. Iron & Tin Plate Co**  
OFFICE: 112 Smithfield St., Pittsburgh, Pa.  
WORKS at Denner Station  
B. & O. R. R., Pgh., Div.  
MANUFACTURERS OF THE  
**Home Made**  
**U. S. CHARCOAL TERNE PLATES**  
Stamping Iron, Show Card Iron,  
Taggers, Bessemer Steel Plates and  
Shovel Iron.  
Stove Pipe Iron cut to size.  
Special sizes of Pickled and Cold Rolled Iron  
made to order.  
Send for specification and price list.

**The Iron-Masters' LABORATORY.**  
Exclusively for the  
Analysis of Ores of Iron, Pig and Manufactured  
Iron, Steels, Limestone, Clays,  
Slags and Coal for Practical  
Metallurgical Purposes.  
No. 339 Walnut St., Philadelphia.  
**J. BLODGET BRITTON.**  
This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.  
**CHARGES TO IRON WORKS.**  
For determining the per cent. of Pure Iron in an ordinary Ore..... \$4.00  
For the per cent. of Pure Iron, Sulphur and Phosphorus in do..... 12.50  
For each additional constituent of usual occurrence..... 1.50  
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.  
For determining the per cent. of Sulphur or Phosphorus in Iron or Steel..... 7.00  
For each additional constituent of usual occurrence..... 5.00  
For the per cent. of Carbonate of Lime, and insoluble Silicious Matter in a Limestone..... 10.00  
or each additional constituent..... 2.00  
or the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal..... 12.50  
For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an ore.  
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.  
Printed Instructions for obtaining proper average samples for analysis furnished upon application.

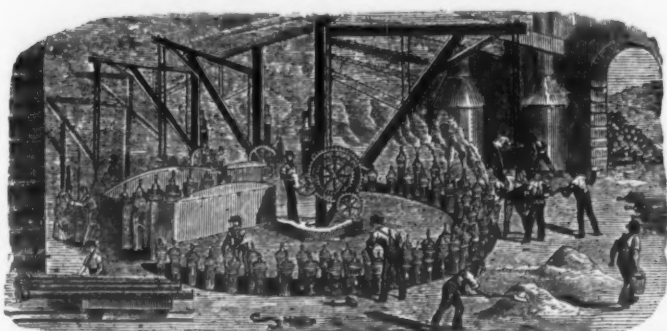
**BRADLEY, REIS & CO.,**  
NEW CASTLE, PA.,  
Manufacturers of every description of  
**PLATE & SHEET IRON**  
OFFICE, at Works.

**THE "BOSS"**  
Scroll Saw.  
The Best and most Practical of its kind in use.  
Simple, Cheap, Light Running and Durable.  
With adjustable table for laying work, it is especially adapted for ladies' use.  
Price \$20. Liberal discount to the trade. For Circulars and particulars apply to  
**LEWIS MFG. CO.,**  
Seneca Falls, N. Y.



## McNEALS & ARCHER,

BURLINGTON, N. J.



Flange Pipes.

General Foundry Work.

## CAST IRON PIPES

FOR WATER AND GAS.

## THE EDGAR THOMSON STEEL CO., LIMITED.

MANUFACTURERS OF



STEEL RAILS, BLOOMS &amp; INGOTS

General Office and Works at Bessemer Station (Penn. R. R.), Allegheny County, Pa.

New York Office, 57 Broadway.

The members of the Edgar Thomson Steel Company, Limited, have had large experience in manufacturing and in railway management; their works are the most complete in the world, with all the latest improvements, and are located in the best Bessemer metal district in the United States, and their managing officers are experienced in the manufacture of Bessemer Steel.

The Company warrants its rails equal in quality to any manufactured in the United States.

Rails of any weight or section furnished on short notice. Orders for trial lots solicited.

Branch Office and P. O. Address, No. 48 Fifth Ave., Pittsburgh, Pa.  
D. McCANDLESS, Chairman. W. M. P. SHINN, General Manager.

## MIDVALE STEEL WORKS,

CRUCIBLE AND OPEN HEARTH STEEL.

## TIRES AND AXLES

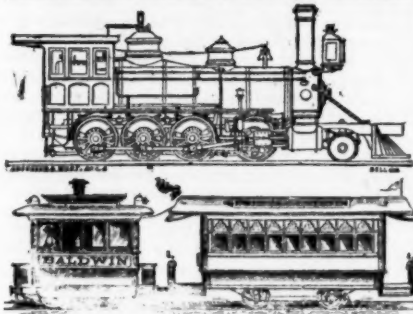
OF EVERY DESCRIPTION.



## TOOL, MACHINERY AND SPRING STEEL CASTINGS AND FORGINGS.

WORKS AND OFFICE:  
Nicoletown, Philadelphia, Pa.

WAREHOUSE:  
12 N. 5th St., Philadelphia, Pa.



## BARDWIN LOCOMOTIVE WORKS,

BURNHAM, PARRY, WILLIAMS & CO., Proprietors,  
Philadelphia, Pa., U. S. A.,  
Manufacturers of

## LOCOMOTIVE ENGINES

of every Description.

Catalogues, photographs and estimates furnished on application of customers.

## NOISELESS STEAM MOTORS,

For city and suburban Railways.

These machines are nearly noiseless in operation; show no smoke with the use of anthracite coal, or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse cars and draw additional cars. Circulars with full particulars supplied.

D. G. GAUTIER, Chairman.

D. J. MORRELL, Treasurer.

CHAS. DOUGLASS, Gen'l Supt.

## GAUTIER STEEL CO., Limited,

JOHNSTOWN, PENN.,

MAKE

## STEEL, WIRE & CARRIAGE SPRINGS,

Of all Kinds of the Best Quality.

WIRE RODS, HORSE RAKE TEETH, STEEL FINGER BARS AND WIRE FENCE STAPLES.

Tire Steel,  
Toe Calk Steel,  
Spring Steel,  
Machinery Steel,  
Bessemer Rounds and  
Squares,  
Sleigh Shoe Steel,  
Cutter Shoes,  
Harrow Teeth,  
Scythe Back Steel,  
Grain Drill Steel,  
Frog Steel,  
Knife Backs,

Pitman's Steel,  
Mower and Reaper Steel,  
Plow and Flow Coupler  
Steel,  
Shovel Steel,  
Hoe, Fork & Pick Steel  
Tack, Plate and Shoe  
Nail Steel,  
Cultivator Steel,  
Cutlery Steel,  
Cast Spring Steel,  
Baby Carriage Spring  
Steel,

Bright Wire,  
Annealed Wire,  
Coppered Wire,  
Galvanized Wire,  
Tinned Wire,  
Wire for Barbed Fencing,  
Wire for Rope,  
Wire for Furniture  
Springs,  
Fence Wire,  
Buckle Wire,

Screw Wire,  
Chain Wire,  
Telegraph Wire,  
Pail Bail Wire,  
Hay Baling Wire,  
Broom Wire,  
Rivet Wire,  
Weaving Wire,  
Card Wire,  
Machinery and Gun  
Screw Wire,  
Vineyard Wire.

Steel for Agricultural Implements and Tools a specialty. Wire Straightened and Cut to Length. Round, Square and Shapes wire furnished in long lengths. All orders filled promptly.

## CARRIAGE AND WAGON SPRINGS.

Elliptic Springs, Platform Springs, Concord Side Springs, C Springs, Road Wagon Springs, Seat Springs.

## RAILROAD SPRINGS.

Eastern Warehouse and Office, - 93 John St., New York City.

## CHROME STEEL WAREHOUSE.

Address JOHN W. QUINCY, Manager, 98 William St., N. Y.

This Steel is made from Chromium and Iron, and is remarkable for Strength, Durability and Uniformity. Send for Circular, where the proof will show it does 25 to 75 per cent. more than other cast steel. It is adapted to all kinds of work where cast steel is used. Chrome Steel Castings from 25 to 500 lbs. to order.

## Southern Advertisements.

## Southern States Coal, Iron & Land Co. LIMITED,

ENGINEERS, IRON FOUNDERS & BOILER MAKERS,  
Coal Miners and Fire Brick Manufacturers.

The Only Makers in the Southern States of

WASHED FOUNDRY COKE,

Free from Slate and Sulphur.

Machine-Made Brick, Limestone, Lumber and Shingles.

FARMS TO LET.

Apply to the HEAD OFFICE, South Pittsburg, Tennessee.

## W. A. HOSKINS,

DEALER IN

## MINERAL LANDS, Chattanooga, Tenn.

Offers for sale, at very low figures, some of the most valuable Charcoal and Coke Properties within the district. Full particulars furnished on application.

## Vulcan Iron & Nail Works, Chattanooga, Tenn.,

MANUFACTURERS OF

BAR IRON, NAILS, RAILROAD SPIKES, FISH BARS AND BOLTS BRIDGE AND CAR BOLTS, AND FORGINGS GENERALLY.

## ROANE IRON COMPANY,

Manufacturers of and Dealers in

## Pig and Railroad Iron.

CHATTANOOGA, - - - - - TENN.

## WASON CAR & FOUNDRY COMPANY, Chattanooga, Tenn.,

Manufacturers of

RAILWAY FREIGHT CARS, Car Wheels and Castings.

## TENN. COAL & RAILROAD COMPANY,

A. M. SHOOK, General Manager, - - - - - Tracy City, Tenn.

Proprietors of the Sevens mine, capacity of 50,000 bushels of coal and coke per day. Several important institutions of learning, including the University of the South, also the celebrated Beersheba Springs, are located upon the line of this Railroad.

Being also the proprietors of several extensive tracts of very fine lands, offer special inducements to colonies. Communications addressed to the General Manager will receive prompt attention.

## T. J. BROWN,

Rockwood, Tenn.

Miner and Contractor of Fossiliferous Ores.

A superior article delivered at low figures at any furnace within the district or at any point on the Ohio River. Refer to Roane Iron Co., Chattanooga Iron Co., or S. B. Lowe, Chattanooga.

## S. B. LOWE,

Pig Iron, Storage & Commission.

Dealer in Charcoal and Coke Pig Iron for Foundry, Forge or Car Wheel purposes. Chattanooga, Tenn.

## JAPANNERS, DECORATORS,

and Manufacturers of

## LIGHT CASTINGS and METAL PATTERNS TAYLOR & BOGGIS,

Cleveland, Ohio.

We invite correspondence and will make estimates on finished work when desired.

## IRON AND STEEL DROP FORGINGS

All shapes, small and large, including Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of Bricklayers', Moulders' and Plasterers' Tools, Saddlers' Round and Head Knives.

## WILLIAM ROSE & BROS.,

36th & Filbert Sts., West Philadelphia.

## RICHARD P. PIM,

MANUFACTURER OF

## MALLEABLE AND GRAY IRON CASTINGS

For Car, Carriage and Tinsmiths' Hardware.

Corner Taylor and Buttonwood Streets, - - - - - WILMINGTON, DEL.

## FENCE WIRE.

Nos. 6, 7, 8, 9 and 10, for using plain.  
Nos. 12, 12½ and 13, for making into Barb Wire.  
No. 20, for Harvester Wire.

Send for prices and samples.

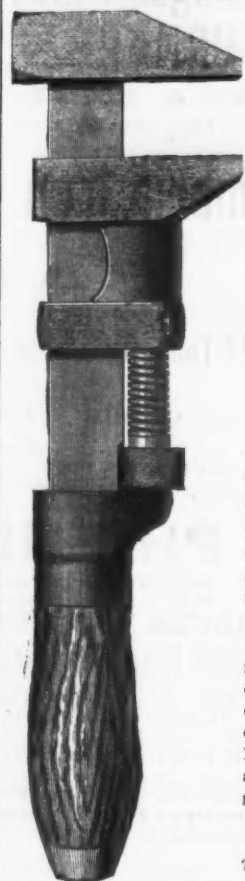
## Lewis, Oliver & Phillips,

91 & 93 Water Street,  
PITTSBURGH, PA.



## STANDARD GIRARD WRENCH. MARK.

WARRANTED.



FOR STRENGTH AND Durability IT HAS NO SUPERIOR. GUARANTEED IN EVERY RESPECT. Wrought Bar, Head and Screw.

Owing to the increased demand for these justly Popular Wrenches, we are now manufacturing more than any other establishment in the world.

Our Wrench having been imitated by other manufacturers, we have adopted the above Trade Mark, and will hereafter stamp all our goods.

SEND FOR TERMS AND PRICES.

GIRARD WRENCH MFG. CO., Girard, Pa.

A. Garrison. J. H. Ricketson. Wm. Holmes

PITTSBURGH FOUNDRY.

## A. GARRISON & CO.,

Manufacturers of

Chilled Sand and Patent Homogeneous Steel

## ROLLS,

Both Solid and Hollow,

Ore and Clay Pulverizers, Rotary Squeezers, Haskin's Patent Double Spiral Pinions, and Rolling Mill Castings of every description.

OFFICE, 6 Wood St., - - - - - PITTSBURGH.

## Coal.

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila.

## A. PARDEE & CO.

303 Walnut St.,

PHILADELPHIA.

No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

## Lehigh Coals.

The following superior and well known Lehigh Coals are mined by ourselves and firms connected with us, viz.

A. Pardee & Co. { HAZLETON, CRANBERRY, SUGAR LOAF.

Pardee, Bro. & Co. LATTIMER.

Calvin Pardee & Co. HOLLYWOOD.

Pardee, Sons & Co. Mt. PLEASANT.

THE HOBOKEN COAL CO.,

Dealers in

SCRANTON, LEHIGH and other COALS.

Retail Yard on D. L. & W. Railroad, cor. Grove and 19th St., Jersey City. Coal delivered direct from Shute to Carts and Wagons. Families and manufacturers supplied with the best qualities of Coal at the lowest rates. OFFICES: At York cor. Grove and 19th St.; cor. Bay St. and Newark Ave., Jersey City; Room 25, 111 Broadway, N. Y. General Office, Bank Building, cor. Newark and Hudson Sts., Hoboken. P. O. Box 24, Hoboken.

## HOWSONS'

OFFICES FOR PROCURING

UNITED STATES AND FOREIGN PATENTS,

Forrest Buildings,

119 SOUTH FOURTH ST., PHILADELPHIA AND MARBLE BUILDINGS

605 Seventh St. (Opposite U. S. Patent Office).

Washington, D. C.

H. HOWSON, Solicitor of Patents. C. HOWSON, Attorney at Law.

Communications should be addressed to the PRINCIPAL OFFICES, PHILADELPHIA.

## PATENTS

Procured for Inventions, Trade Marks, Copyrights, etc.

Advice free. Call or send for book of instructions. Address

JOHN A. WIEDERSHEIM & CO.,

110 South 4th St., second floor, front room, Philadelphia.





## Burrall's Improved Geared Right Hand Iron CORN SHELLER.

is acknowledged by all who have used it to be the  
Best Hand Corn Sheller made.  
These facts are attested by over 70,000 Farmers  
who have bought and used them.  
Send for prices.

**RUMSEY & CO., Limited,**  
Seneca Falls, N. Y.

PRINCIPAL DEPOT,  
93 Liberty Street, - NEW YORK.

## AGATE IRON-WARE

PATENTED  
May 30th, 1876, Feb. 27th, 1877, July 3d, 1877.



The absolute Purity and Safety of  
Agate-Iron-Ware is certified to by  
the following eminent Chemists:  
R. OGDEN DOREMUS, M. D., LL.D., of College of the City of N.Y.  
J. SILLIMAN, State Chemist, Yale College, New Haven, Conn.  
HERBERT G. TORREY, U. S. Assayer, Office, 20 Wall St. N. Y.  
S. C. EASTON, M. D., Analytical Chemist at U. S. Assay Office.  
S. DANA HAYES, State Assayer and Chemist, Boston, Mass.  
HENRY MORTON, Pres. Stevens Inst. of Technology, Hoboken, N.J.  
EDWARD S. WOOD, Prof. Chem., Harvard Med. Coll., Boston, Mass.  
WM. RIPLEY NICHOLS, Professor Gen. Chemistry, Boston, Mass.  
BOOTH & GARRETT, Practical & Analytical Chemists, Philadelphia



Price Lists and Discounts will be sent only to  
the Trade, on application.  
**LALANCE & GROSJEAN MFG CO.,**  
P.O. Box 301, 89 Rockman St., New York.

## PATENT CONVEX Fluting & Smoothing Iron



1st. It can be used as an ordinary Smoothing Iron.  
2d. It is a Fluting Machine as well as a Smoothing  
Iron. 3d. The Fluting Attachment being made of  
brass, and convex in form, it has all the advantages  
of the crank machine. 4th. It combines the two  
articles in one, taking up the room of but one ma-  
chine, and is always ready for use.

**A. A. WEEKS, Manufacturer,**  
No. 82 John Street, New York.

## NATIONAL STEAM PUMP.

Adapted to every possible Duty.  
Send for illustrated catalogue.  
**WM. E. KELLY,**  
New Brunswick, N. J.

Now to be seen at the American Institute Exhi-  
bition, New York.

## PATENTS.

**THOMAS D. STETSON,** 23 Murray St., N. Y.,  
Patent Solicitor and Expert.

## W. & B. DOUGLAS,

MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

## PUMPS. HYDRAULIC RAMS, GARDEN ENGINES

Yard Hydrants, Street Washers.

AND OTHER

## Hydraulic Machines

IN THE  
WORLD.

Awarded the GRAND MEDAL at  
WORLD'S EXPOSITION, Paris, France,  
1878, being the highest award on Pumps,  
&c.; also the highest Medals at Paris,  
1867, Vienna, 1873, and Philadelphia,  
1876, accompanied by the Report of  
Judges.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,

85 & 87 John Street, N. Y.

AND

197 Lake St., CHICAGO, Ill.



## UNION MANUFACTURING COMPANY,

Manufacturers of all styles Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE,

## Cast Fast & Loose,

Drilled and Wire Jointed.

Japanned, Figured Enamelled, Nickel Plated  
and Real Bronze Butts. Also a full line of

## IRON & BRASS PUMPS

Cistern, Well and Force Pumps, Yard Drive Well,  
Garden Engine and Steam Boiler Pumps, Hydraulic  
Rams, etc., and all with the most modern improvements.

## Centennial Spring Hinges.

This Hinge has two flat coil springs,  
very powerful. It has a heavy solid  
pin, giving much less friction than a  
hollow pin. It has broad, solid bear-  
ings in the knuckle, which do not wear  
down readily and let the door sag. It is  
Fast Joint, therefore can be used for  
either right or left hand. By actual test  
it has an average of 50 per cent. more  
power than other Spring Hinges in com-  
mon use of same size.

27 Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouses,

98 Chambers St., New York.

67 Kilby St., Boston (Pumps).

Heaton & Denckla, 507 Com-

merce St., Phila. (Butts).

Send for Illustrated Catalogue and

Price List.

## THE IMPROVED HOWE SCALES.

PARIS, 1878.



THEY WERE AWARDED  
THE GOLD MEDAL,  
AND SEVERAL SPECIAL MEDALS OF GOLD, SILVER  
AND BRONZE. At Baltimore, the MARYLAND IN-  
STITUTE AWARDED THE "HOWE" THE GOLD MEDAL.  
Also, at KENTUCKY, MINNESOTA, MISSOURI,  
OHIO, WISCONSIN, IOWA and MARYLAND THE  
"HOWE" TOOK THE First Premium. THE U. S. GOVERNMENT HAVE FOR THE THIRD CONSECUTIVE  
YEAR AWARDED THE "HOWE SCALE CO." THE CONTRACT FOR SCALES.



Made by the

## HOWE SCALE CO., Rutland, Vt.

GENERAL AGENCIES:

**PRIEST, PAGE & CO.,**  
325 Broadway, New York.  
145 Franklin St., Boston, Mass.  
213 Market St., Philadelphia, Pa.  
63 Wood St., Pittsburgh, Pa.

**A. M. GILBERT & CO.,**  
95 to 101 Lake St., Chicago, Ill.  
116 Main St., Cincinnati, Ohio.  
157 Water St., Cleveland, Ohio.  
612 N. Third St., St. Louis, Mo.

**M. C. HAWLEY & CO.,**  
301 to 309 Market St.,  
San Francisco, Cal.  
43 to 47 J St., Sacramento, Cal.  
Portland, Oregon.

**H. GADBURY**  
4 Light St., Baltimore, Md.  
**J. F. DENNIS,**  
European Manager,  
Bremen.

## The only GENUINE D. R. BARTON Tools

ARE MADE BY

## THE D. R. BARTON TOOL CO.,

Cor. Mill and Furnace Streets, ROCHESTER, N. Y.

**HEATON & DENCKLA,** - - - 507 Commerce Street, Philadelphia, Pa.  
**H. O. STRATTON,** - - - 33 Oliver Street, Boston, Mass.  
**HUNTINGTON, HOPKINS & CO.,** - - - Sacramento.  
**NATHAN WEED,** - - - 4 Gold Street, New York.

## BAEDER, ADAMSON & CO., Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felt-  
ing for Covering Boilers, Pipes, &c., Cow Hide Whips  
Stores: PHILADELPHIA, 720 Market St., BOSTON, 143 Milk St.  
NEW YORK, 67 Beekman St., CHICAGO, 182 Lake St.

## A Consular Report from the Rhine Provinces.

The commercial agent of the United States at Aix-la-Chapelle, Germany, under date of July 20th, sends to the Department of State an interesting dispatch relative to the condition of commerce and trade in his consular district. He refers to the disastrous retrogression which has been experienced everywhere within the last few years, both in manufacturing and commercial industries, and states that extensive establishments, which once employed many hundred men, are now apparently idle. The thrift and busy hum of industry which characterized that rich and fertile region but a few years since, now seems lagging and almost lifeless.

### IRON.

The Iron industry has the appearance of general sluggishness, and what is produced finds nothing but the most discouraging prices in the market; so depressed has been this condition that several large establishments here temporarily suspended because they were sustaining a constant loss. Many who are peculiarly interested in this great industry claim that in view of the vigorous competition of foreign iron and the decrease in the consuming capacity of the country, there is left to the manufacturer only the choice between two evils—either business must be suspended or totally annihilated by foreign competition, or the work must be prosecuted at the very lowest prices and the market furnished at cost or even at a losing value. To discontinue business is sure loss, while to prosecute it is running a dangerous risk of finding nothing but a losing market. The consequence is that many million dollars which are invested in this industry are as devoid of interest as though they were buried in the depths of the iron beds themselves.

### COAL.

A large amount of bituminous coal is mined in this district, but at present the same sluggishness which is so conspicuous in all the branches of industry is to be seen in this enterprise. Most of the mines continue in operation on half time, but the recompense for the work done is so small that the miners and manipulators are greatly depressed and discouraged. As it is with the above-mentioned industries, so it is with all the rest, especially with the soap, machine, linen, needle and woolen manufactures.

### THE LEATHER TRADE

is a branch of German industry which has received a greater shock from American competition than any other department of manufacturing enterprise. Since our manufacturers began to obtain a foothold in the markets of Germany during the year 1874, a gradual decline has taken place in the production and sale of German and English leather. The prices obtained for the ready-made article have become so depressed that scarcely any recompense for the capital invested has been derived during the past year. The prices offered for current orders are so low that, owing to the continued high price of oak-bark, the manufacturer finds it absolutely impossible to fill them without more or less sacrifice. This is the result of a powerful and increasing American competition. Every year the German sole-leather industry wanes, and the demand for American leather waxes stronger. It is estimated that 600,000 sides of sole leather were exported from America to the German markets from the 1st of June, 1877, to the 1st of June, 1878, and the demand increases; and with its increase comes a shadow over the leather industry of this land. Men having large sums of money invested in the enterprise see how futile is any attempt at competition with the American henlock-tanned leather, and have consequently appealed to the imperial government for protection. They claim that unless a higher protective tariff is at once adopted against the importation of American sole leather, the German leather industry, once so flourishing and remunerative, will be dangerously crippled if not entirely destroyed. But while the manufacturer makes this appeal, the consumer, by the preference he shows for American leather, expresses a positive desire that its present condition of importation should remain undisturbed, unless some other measure could be adopted by which the facilities for its introduction into the German market would be increased. In all the reports upon the subject from the different chambers of commerce, there is a general disposition to complain of the quality of the American leather. The argument is used that the German leather is of a better quality and ought not to be superseded by the cheaper material which American industry and enterprise has crowded upon their market. If it be true that the American leather is poorly tanned, and that the high quality of the German article more than counterbalances the cheapness of the American product, the question naturally arises, Why does not the consumer complain? His voice has never been raised against the American article, while his hand is constantly stretched out to receive it with favor. His interest in the quality of the leather consumed is direct, and it is only just to defer to his judgment. The voice of complaint and protest is raised only by those who have capital invested in the business, and who have within the past two years been compelled to recognize the fact that a former lucrative market has become an irresistible competitor. The boot, shoe, harness and carriage makers of Germany prefer the American leather, and the wonderful inroads that this article has made upon the market of this land teaches the great commercial truth that what satisfies most sells best, and that material which pleases the consumer will always find a superior demand in the marts of the world, in spite of the natural prejudice of home interests and false rumors of inferiority.

### PINS AND NEEDLES.

For the past four years, and up to the close of the contest between the Cossack and Mussulman, this branch of industry has been discouraging to those interested in its prosperity. Within the past three months, and especially since the clouds of a general European war have disappeared, a new impulse

has been given to this enterprise, and some establishments have already been enabled to increase their working hours. I cannot learn that the American needles have ever reached the North German market to any extent, but as they have competed successfully in the English market, there is ample ground for hope that they may obtain a firm and remunerative place in the German trade.

### GLASS MANUFACTURE

is quite an extensive industry in this district, but in company with all other manufacturing interests it has suffered from the general depression existing throughout the commercial world. In the looking-glass business there has been a decrease of 15 per cent. in the sales and 20 per cent. in the production, as compared with the estimates of last year. This has arisen chiefly from the competition of foreign ware, in which rivalry the American product played but a small part, the principal competition being from the Belgian glasses. The window-glass factories, owing to the inactivity of all building enterprises, have been in a state of comparative idleness for the past year, and what little material has been produced finds a meager market and a still more meager price.

### THE SODA INDUSTRY

is in a distressed condition, owing to the idleness of the industries on which it depends for a market. This is one cause of its depressed condition, but there is another and more potent one. Within the past two years English shippers have freighted the German markets with soda at rates which have been fatal to the home industry. Since 1874 there has been a decrease in the demand for the German soda to such an extent as to compel a reduction of nearly one-third of the amount produced in that year. In 1875 the protective tariff was reduced nearly two-thirds, from which time England commenced a vigorous competition, which has proven so disastrous to the German soda interests that those interested in the enterprise are making strenuous efforts to secure an increase in the tariff in order to save the home industry from annihilation.

THE MANUFACTURE OF PAPER, once a prosperous and remunerative business, has fallen off in production since 1875 about one-fourth. The principal cause of this shrinkage is the pressing and irresistible competition of American and English paper. While the foregoing facts show the present condition of trade and manufacturing interests of this district as being in a deplorable condition, there is evidence of a revival of business in all these branches of industry since the Berlin congress accomplished its good work.

The president of the Royal Society for Northern Antiquities, in Copenhagen, Mr. Worsaae, whose archaeological and historical works are well known to English and American archaeologists, gave, at the meeting of the society, Nov. 20, an elaborate account of the archaeological discoveries made in the last 10 years in America, and the inferences drawn from these discoveries by American archaeologists, Abbot, Rau, and others, and called attention to the fact that American archaeology not only confirms what European archaeology has established concerning the so-called Stone Epoch in the history of mankind, but also, in details, presents many a missing link, and promises to give a considerable extension of our knowledge of this stage of civilization. Alluding to Von Siebold's discovery, in Japan, of mounds very similar to those found in Alaska, Canada and Scandinavia, Mr. Worsaae made a remark on the arrangement of the archaeological museums in America which is worth noticing. He complained that in most cases no indication is given of the place in which the article was found, and he considers this a fault, because it might be of the greatest importance to know whether or not there exists a difference between articles found on the Atlantic and articles found on the Pacific coast; whether or not there exists a closer resemblance between articles found on the western coast of America and the eastern coast of Asia, and between articles found on the eastern coast of America and the western coast of Europe, &c. Mr. Abbot's view that America has been inhabited as early as Europe, Mr. Worsaae is not unwilling to accept, though he thinks that it has not yet been established as a scientific fact.

The arrivals of immigrants are larger than they were in 1877, the number arriving at New York from January 1 to November 30 being 116,049, of which 72,147 were aliens and 43,902 citizens. For the same period last year there were 92,682 arrivals, of which 52,009 were aliens; and for the first eleven months of 1876, a total of 109,592, 65,820 of which were aliens. It will be seen that there has not been any great change in the number of American citizens arriving from abroad, but the increase is mainly of foreigners. Germany continues to furnish the largest number of immigrants, Ireland being a long way in the rear. Many of the immigrants "go West and grow up with the country," in farming communities, and make valuable additions to our national wealth.

Cleveland papers report that Mr. Chas. F. Brush, inventor of the Brush dynamo-electric machine, has completed and exhibited apparatus for a New England cotton mill, which gives 18 lights of 2000 candle power each, a 14-horse engine being used to furnish the power. The lights are claimed to be under perfect control, and not disturbed by accidents to one or more in the circuit. The carbons in each lamp, it is also claimed, cost 72 cents, and last 8 hours. This is about one-sixth the cost per candle power of the Jablochhoff lights in the streets of Paris, which, however, cost more than the gas lights they displace.

The shipments of quicksilver from San Francisco are heavier than they were a year ago. The shipments by sea for the first eleven months amounted to 31,312 flasks, valued at \$1,036,293. China, not content with getting our trade dollars, continues to be our best customer for quicksilver, having taken 19,820 flasks out of the whole number shipped. Of the remainder, Mexico took 6716 flasks and Peru 1200 flasks.





# USE THE BEST.

## NEW



THE NEW AMERICAN FILE COMPANY have the exclusive right to use the Bernot process for cutting Files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing Files and Steel.

**NEW AMERICAN FILE CO., Pawtucket, R. I.**

### AUBURN FILE WORKS,

Superior Hand-Cut

## FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

**FULLER BROS., Sole Agents,**

89 Chambers and 71 Reade Streets, N. Y.

Granted for

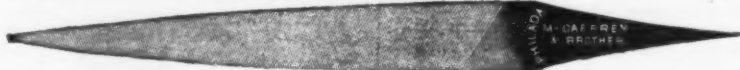


**McCAFFREY & BRO.,**

Pennsylvania File Works,

Fourth St., north of Columbia Ave., Philadelphia, Pa., U. S.

Superior Goods.



Silver Medal.

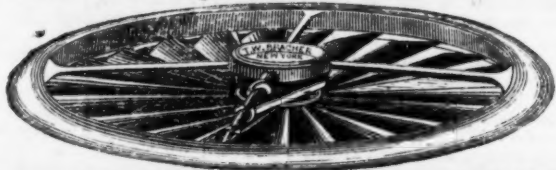


Domestic and foreign buyers who are desirous of handling a superior File or Rasp should send us their orders. Gentlemen visiting the Exhibition Universelle in Paris are invited to examine our exhibit at D 3, American Section.

Highest Premium.



### Steam and Frost prevented on Show Windows.



### REVOLVING VENTILATORS

For everything (and every size), from a hat or cap to an exhibition building.

Kitchens, Laundries, &c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, \$1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &c.; applied to any window or room.

Prof. A. L. LOOMIS, M. D., University of City of New York, writes as follows:

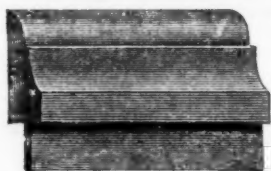
"From my personal experience and that of my patients who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

Air Filters and Moisteners, placed over hot-air registers of furnaces, &c., prevent dust and supply steam filtered air. Prices and discounts to the trade sent on application.

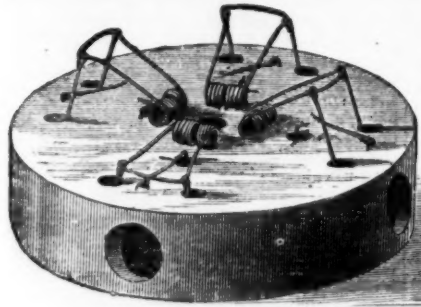
The "Economy" Molding Weather Strip is perfect in every respect. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all after expense of molding. Once purchased it will last a lifetime, because rubber, etc., has only to be removed by taking old piece out of either end of molding, and sliding in new piece. By this method of securing rubber all without any fastening or undoing of glue or tacks is overcome.

Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Mouldings, &c., and thus make perfect Weather Strips.

No. 6.



**BRACHER VENTILATOR CO., No. 3 Park Row, New York.**



"Common Sense"

### MOUSE TRAPS,

For Home and Export Trade.

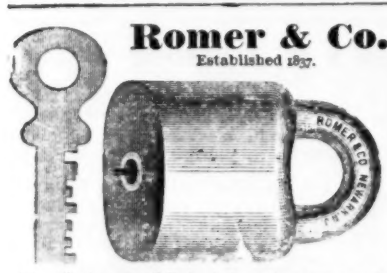
**BEST IN MARKET.**

**RIPLEY MFG. CO.**

Unionville, Ct., U. S. A.,

Manufacturers of

House Furnishing Hardware.



**Romer & Co.**

Established 1837.

Manufacturers of Patent Scandinavian or Jail Locks, Brass Pad Locks for Railroads and Switches. Also Patent Stationary R. R. Car Door Locks. Patent Piano and Sewing Machine Locks.

111 to 145 Railroad Avenue, NEWARK, N. J.

Illustrated Catalogue sent to the trade on application.

### MACHINE MOULDED MILL GEARING.

AS ACCURATE AS CUT GEARING

AND MORE DURABLE IN USE.

Saves Time and Expensive Patterns.

SHAFTING, PULLEYS AND HANGERS.

A SPECIALTY.

LEFFEL TURBINE WATER WHEELS.

STEAM ENGINES AND BOILERS.

MIXERS FOR FERTILIZERS AND CHEMICALS.

**POOLE & HUNT, Baltimore.**

### FILES & RASPS,

Best Cast Steel.

HAND-CUT. Manufactured by

**JOHNSON & BRO.**

No. 1 Commercial Street, Newark, N. J.

ESTABLISHED 1866.

**Chas. Spruce & Co.,**

Manufacturers of HAND CUT

**FILES AND RASPS.**

Every File warranted.

**CHALMERS & MURRAY,**

Sole Agents, 76 Reade St., New York.

ESTABLISHED 1866.

**SPENCER & UNDERHILL,**

94 Chambers St., N. Y., Agents for

American Screw Co.'s Wood, Machine and

Rail Screws, Stove and Tire Bolts, Rivets, &c.

O. Ames & Sons, Shovels, Spades and Scoops.

A. Field & Son, Tacks, Brads, Nails, &c.

G. F. Warner & Co., Carriage Clamps.

We have also on hand a general assortment of Hardware



**THE GIANT PAD LOCK.**

Manufactured by

**THE SMITH & EGGE MFG. CO.**

(Centennial Award.)

"Superior in Every Respect."

This is one of the best-selling Locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted.

Orders solicited. Address as above.

Lock Box 105, Bridgeport, Conn.

**Keystone**

**CLOTHES WRINGERS.**



**Wood Frame Cog-Wheel Wringers.**

| No. | Size of Rolls. | Price per doz. |
|-----|----------------|----------------|
| 10  | 10X13 1/2      | \$60.00        |
| 12  | 10X13 1/2      | 65.00          |
| 16  | 11X13 1/2      | 68.00          |
| 18  | 11X13 1/2      | 71.00          |

**Wood Frame Friction Wringers.**

| No.   | Size of Rolls. | Price per doz. |
|-------|----------------|----------------|
| 1 1/2 | 10X13 1/2      | \$51.00        |
| 1     | 10X13 1/2      | 54.00          |
| 3     | 11X13 1/2      | 62.00          |

**Self-Adjusting Iron Frame Friction Wringers.**

| No.   | Size of Rolls. | Price per doz. |
|-------|----------------|----------------|
| 2 1/2 | 10X13 1/2      | 51.00          |
| 2     | 10X13 1/2      | 54.00          |
| 4     | 11X13 1/2      | 62.00          |

**EVERY WRINGER WARRANTED.**

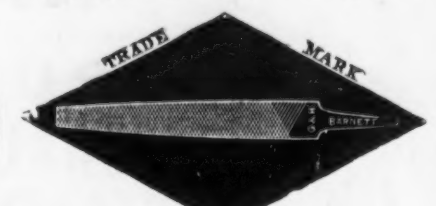
Special rates given for export.

Send for price list of other goods for home and export trade.

**F. F. ADAMS & CO.,**

Erie, Pa.

## Black Diamond File Works.



Awarded by Jurors of Centennial Exposition, 1876, for

"VERY SUPERIOR GOODS."

**G. & H. BARNETT,**

39, 41 & 43 Richmond St., Philadelphia.

### CHARLES B. PAUL,

Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 187 Tenth Street, Williamsburg, New York.

All descriptions of Files made to order. Price List mailed on application. Established 1866.

**HELLER & BROS.,**

MANUFACTURERS OF CELEBRATED

**AMERICAN HORSE RASPS AND FILES,**

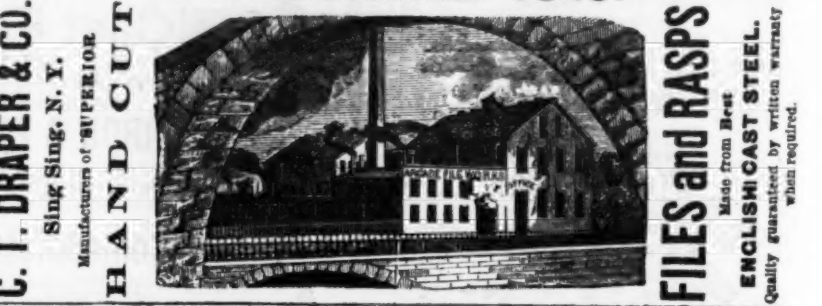
NEWARK, N. J.



In view of the many so-called improvements and ingenious arrangements of the teeth of Horse Rasps made within the last few years, we take occasion to recommend our own Horse Rasps, made of the best American Steel, all hand cut in the old style by the most skilled mechanics; and we guarantee them to be unequalled in the market, as is best evinced by the unanimous verdict of all the skilled horsehoers who are using them for the last fifteen years all through the United States.

For sale by the leading Hardware and Iron Dealers in the United States and Canada.

**ESTABLISHED 1848.**



C. T. DRAPER & CO.

Sing Sing, N. Y.

Manufacturers of SUPERIOR

HAND CUT

FILES AND RASPS

Made from Best

ENGLISH CAST STEEL.

Quality guaranteed by written warranty when required.

**AUSABLE HORSE NAILS**

POLISHED OR BLUED.

**HAMMERED AND FINISHED**



5 6 7 8 9 10



**The Ausable Nails**

Are Hammered Hot,

And the Finishing and Pointing are

Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

For Sale by all Leading Iron and Hardware Houses.

**ABRAHAM BUSSING, Secretary,**

4 Warren Street, New York.

### Philadelphia Screw Co.,

MANUFACTURERS OF

**Iron and Brass**

**WOOD SCREWS**

Of Every Description.

OFFICE AND FACTORY,

N. W. Cor. 12th & Buttonwood Streets, Philadelphia, Pa.

Complete assortment at lowest market rates.



# A. FIELD & SONS

TAUNTON, MASS.,

MANUFACTURERS OF

## AMERICAN AND FRENCH WIRE NAILS, TACKS, SHOE NAILS, And Every Variety of Small Nails.

Offices & Factories at Taunton, Mass.

Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, Wire Nails, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

### Hoisting Machinery

MANUFACTURED BY  
CRANE BROTHERS MFG. CO.,  
Chicago.

### The Upright Family Scale

PATENTED.



With Tin Dish.  
Weighing 12 lbs.  
by 1/2 lb.

List \$16 per  
Dozen.

Liberal Discount  
to the Trade.

This Scale has an  
attachment for  
Taking the  
Tare. Just the  
thing for family use.

Manufactured by  
JOHN CHATILLON & SONS,  
89, 91 and 93 Cliff St., NEW YORK.

### Geo. M. Eddy & Co.,

351 & 353 Nassau Ave., Brooklyn, N. Y.  
Manufacturers of

### MEASURING TAPES.

Of Cotton Linen and Steel.  
For all purposes for which Tape Measures are required.  
Only manufacturers of

Paine's Patent U. S. Standard Steel  
Measuring Tapes.

Pat. Spring Measuring Tapes  
of Lignum and Steel.

FINE TEMPERED STEEL SPRINGS,  
FINE TEMPERED STEEL HAND SAWS,  
From 1/2 inch wide upward. Warranted tougher than  
any other Hand Saw. Catalogues on application.

### PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris,  
1867; Moscow, 1872; Vienna, 1873, and only  
Award and Medal for Self-Coiling Steel  
Shutters at Centennial Exhibition,  
Philadelphia, 1876.

### CLARK & CO.,

ORIGINAL INVENTORS AND SOLE  
PATENTEES OF

### Noiseless Self-Coiling Revolving

### STEEL SHUTTERS,

FIRE AND BURGLAR PROOF.

Also Improved

### Rolling Wood Shutters

Of various kinds. Clark's Shutters are the Best  
and Cheapest in the world. Are fitted to new  
Tribune Building, Lenox Library, Delaware and Hud-  
son Canal Co.'s Building, Transatlantic Steamship  
Co.'s new Dock, American News Office, &c., Posey  
County Court House, Mt. Vernon, Holt County  
Court, Oregon, Mo. Also to buildings in Boston,  
Cincinnati, Detroit, Janesville, Wis., Baltimore,  
Canada, &c. Have been for years in daily use in  
every principal city throughout Europe, and are in-  
dorsed by the Leading Architects of the  
World.

Office and Manufactory,

162 & 164 West 27th Street, N. Y.

### ANSONIA CORRUGATED STOVE PLATFORM

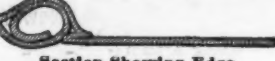
Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,  
NEW YORK.



Out Showing Round Platform.



Section Showing Edge.

### ANSONIA Bronzed Fire Screen,

With Ornamented Mouldings.

PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or  
Shield, as shown in the illustration, is especially  
designed for the safety and protection of walls, fur-  
niture, woodwork, paper or varnish from heat.  
Being constructed of metal, with firm and substan-  
tial edges, curved in form to stand alone, it may be  
easily adjusted to any position about a stove, before  
a grate or fire place. The demand for something  
useful, durable and ornamental as a Fire Screen has  
long been felt, and having finally accomplished the  
desired result, we are prepared to fill all orders  
promptly.



### BROWN & SHARPE MFG. CO

Providence, R. I.,

MANUFACTURERS OF

### MACHINERY & TOOLS.

Gears Cut and Index Plates Made and  
Drilled to Order.



### PATENT CUTTERS FOR THE TEETH OF GEAR WHEELS

can be sharpened by grinding without changing their  
form. Cutters made on this plan will outlast many of  
the old form, with the advantage of being always ready  
for use. If the cutter becomes dull before a wheel is completed, it can be taken out, sharpened and  
returned to its place in a few moments without risk of altering the form of teeth to be cut. Cutters  
for milling any irregular form made to order on the same plan. Parties having occasion to use mills  
for irregular shapes on sewing-machine, gun or other work, will readily see the advantage such cutters  
possess over those in general use, both as regards economy and convenience. Descriptive circular  
with price list sent by mail on application.

### SABIN MFG. CO.,

MONTPELIER, VT., Manufacturers of

### PATENT DOUBLE ACTING SPRING BUTTS,

Sabin's Lever Door Springs

For Heavy Doors.

The BOSS and CROWN SPRINGS for Screen and Light Inside Doors.

General Agents. { HENRY BROOKS & CO., 127 Milk Street, Boston.  
E. F. WHIPPLE, 100 Chambers Street, New York.  
KELLOGG, JOHNSON & BLISS, 108 Randolph Street, Chicago.

### RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I. WORKS at Valley Falls, R. I.

Manufacturers of

PERKINS and RHODE ISLAND PATTERNS OF

### HORSE AND MULE SHOES.

### THE PARIS EXPOSITION.

Great Britain and Her Colonies.—IV.

(From our Special Correspondents.)

THE IRON AGE,  
B. 3, American Section Exposition Universelle,  
PARIS, Dec. 2, 1878.

Various coal companies exhibited samples  
of their products. Among the principal  
of these exhibits we noticed that made by the  
Wigan Coal and Iron Company, Limited.  
The works of this company are situated at  
and near Wigan, in the county of Lancaster,  
England. They comprise extensive collieries  
and establishments for the manufacture of  
coke, also smelting furnaces for the produc-  
tion of pig iron. About 10,000 hands are  
employed. The coals produced are the can-  
nel coal, gas coal, steam coal and house coal.  
Samples of the cannel and gas coal are  
exhibited, and we give below some details  
concerning them. The output of the colli-  
eries approaches 2,000,000 tons per annum.  
The coke works consist of 600 ovens, with  
all appliances for washing the small coal  
from which the coke is manufactured. The  
iron-smelting establishment has 10 furnaces  
of modern type, and appliances capable of  
yielding 500 tons of pig iron daily. The  
company has also a large tract of mineral  
ground, near Chertell in Algeria, pur-  
chased for the purpose of working iron ore  
for the use of their iron-smelting works.  
Among the objects exhibited we found a sec-  
tion showing the workable seams of coal in  
the Wigan district from the top seam down  
as far as the cannel coal; specimens of iron  
ore extracted from the company's mineral  
property in Algeria; samples of the pig iron  
made from this ore, brand K. H. M.; and  
cannel coal used almost entirely for gas mak-  
ing. An analysis made by Prof. Penny of  
Glasgow gave the following results: Purified  
gas per ton of cannel, 10,376 cubic feet;  
illuminating power of gas burning 5 cubic  
feet per hour, 24 1/2 candles; coke per ton of  
coal, 12 cwt. 40 1/2 lbs.; carbon in coke, 97  
per cent.; ash in coke, 3 per cent.; specific  
gravity of cannel, 1.268; weight of a cubic  
foot of cannel, 79 1/4 lbs. The Wigan Coal  
and Iron Company also exhibited a specimen  
of Orrell or Arley Mine coal, used for house  
fires and for making gas. The following  
analysis of this coal was made by W. King,  
C. E., engineer of the Liverpool Gas Com-  
pany: Purified gas per ton of coal, 9780  
cubic feet; illuminating power of gas burn-  
ing 5 cubic feet per hour, 18.3 candles; coke  
per ton of coal, 13 cwt. 1 qr. 12 lbs.; carbon  
in coke, 97.71 per cent.; ash in coke, 2.29  
per cent.; specific gravity, 1.279; weight of  
a cubic foot of coal, 79.7 lbs. The Cambrian  
Patent Fuel Company, Limited, had some  
artificial compressed coal. In the main ex-  
terior gallery facing the palace of the Troca-  
déro we found an obelisk built up of blocks of  
coal taken from 18 coal mines in the coun-  
ties of Pictou, Cape Breton and Cumberland  
(Nova Scotia).

A large number of sewing machines were  
exhibited in the British section. Prominent  
among these were the Singer and the Howe  
machines. Among the English machines we  
noticed those of Keats, Smith, Stanley & Co.,  
Limited; Newton, Wilson & Co., and Tay-  
lor's Patent Sewing Machine Company,  
Limited.

Three of the most important exhibits of  
hand tools were made by Thomas Jowitt &  
Sons, saws and hand-cut files; Thomas Tur-  
ton & Sons, saws, edge tools, rasps, &c.,  
and John Bedford & Sons, saws, files and  
other tools; all three being Sheffield firms.  
Samuel Chatwood, London, Herring's com-  
petitor in the famous battle of safes which  
came off at the Paris Exhibition of 1867,  
had an important exhibit of safes and locks.  
Numerous exhibits of hardware, hollow-  
ware, pins, needles and fish hooks occupied a  
considerable portion of the main hall of the  
British section.

The production during the year 1876 of  
fine copper of the Wallaroo and Moonta  
mines, South Australia, was represented by a  
large obelisk. An octahedron containing  
200 cubic feet represented the gold raised in  
Canada to December, 1877. Of this amount  
British Columbia had furnished 5,852,000  
ounces; Nova Scotia, 271,000 ounces; Que-  
bec, Ontario, &c., 50,000 ounces, making a  
total of 4,173,000 ounces, worth \$66,768,000.

The annex following the United States  
Agricultural Annex was devoted to a great  
extent to exhibits of carriages and carriage  
hardware. Prominent among the former  
stood the exhibits of the Bristol Wagon  
Works Co., Limited, Bristol, England, and  
Henderson & Co., Glasgow, Scotland. The  
former exhibited only three specimens of  
their carts for all classes of work, although  
they manufacture wagons, drays, trolleys,  
agricultural implements, horse cars, and  
railway rolling stock as well. These vehicles  
were their light spring tipping car, which is  
fitted upon patent axle and three springs.  
These latter do not prevent the cart from  
being so constructed as to tip completely  
backward. The body is kept in place by an  
improved self-fastening tipping lever. The  
other two specimens consisted of a brewer's  
cart, low on the ground and convenient for  
loading, but with high wheels for ease in  
draught, and a four-wheel spring trolley.  
Messrs. Henderson & Co. exhibited a side-  
light landau for single or pair horse, fitted  
with patent automatic balance spring-head,  
which can be opened or closed from the  
inside. It is hung on long easy springs, with  
India rubber bearings; these, it is claimed,  
giving a soft and noiseless motion, as well  
as ensuring greater durability to the wheels  
and under carriage. The brake is on an  
improved principle, and is fitted with Hen-  
derson's India-rubber concealed dovetail  
drag blocks. Another improvement adopted  
by the firm in this landau is the patent rub-  
ber-cushioned axle. This consists mainly of  
elastic India rubber cushions securely em-  
bedded in each stock, upon which rests the  
entire weight of the carriage. This firm  
also showed an ingenious arrangement for  
balancing a Whitechapel cart, so as to  
adapt it to the varying character of the road.  
By the contrivance referred to the driver  
has simply to turn a small handle attached  
to the driving seat to throw the weight for-  
ward toward the horse, and by reversing

the action the weight can be thrown to  
the back part of the vehicle.

And now we have completed our ex-  
amination of the British exhibits, and  
with it our reports on the Paris Ex-  
hibition. As we write these lines the  
Great World's Fair of 1878 is already  
a thing of the past, and victors and  
vanquished are hurrying from the Champ  
de Mars, the spectator of many a bloodless  
battle in the campaign of peace which has  
been carried on there for over half a year.  
A feeling akin to sadness comes upon us as  
we make our way through the piles of full  
and empty cases, the throngs of busy work-  
men and curious visitors. The flooring of  
the immense palace has been torn up to  
uncover the tracks over which the machin-  
ery passed on its way to the show, and over  
which it is now rolling on its way home.  
Wherever we turn our footsteps we find a  
feverish activity. Every nerve is strained  
now in tearing down what took so long to  
set up—that immense, beautiful, varied,  
heterogeneous, artistic, wonderful mass of  
wealth, the product of the arm, brain and  
soul of humanity. What was the Paris  
Exposition of 1878 is now relegated to the  
domain of history.

### Notes and Gossip.

The work of demolition has advanced with  
astonishing rapidity. Chaos is every-  
where. The atmosphere in the building  
is clouded with dust. Hammer blows and  
voices shouting orders to the workmen  
echo through the long galleries. There are  
sounds of terrible confusion. In every  
available exterior space trucks and delivery  
wagons waiting their turn block the way.  
The hardened gravel walks are cut up and  
broken by the digging out of the railroad  
for transporting the goods and the crushing  
loads that lumber over them. Not many  
more days can elapse before the dismantling  
will be accomplished. The French section,  
which was the last to be touched—very few  
of the exhibitors removing any goods before  
the 10th—is now in the worst condition.  
The Japanese, English and some of the  
American exhibitors began packing up  
promptly on the 1st of November, but the  
sections of these various people do not pre-  
sent any such scenes of devastation as the  
French galleries. This astonishes me con-  
siderably, as at the opening work lagged  
greatly, and the *laissez aller* of the  
French laborers promised for some weeks to  
keep the prospective exhibition in con-  
fusion. The scene nearest to that we  
are having on the Champ de Mars is the  
animated picture a railway depot presents  
at the moment a train arrives. Entrance  
to the Exhibition grounds is forbidden to the  
public. Exhibitors, officers, journalists,  
workmen and those absolutely interested  
and connected with the works are allowed  
to pass in by showing either their photo-  
graphic cards or tickets granted especially  
for the occasion. The *Gaulois* says that  
yesterday 150,000 Parisians who had not  
yet seen the Exhibition applied for per-  
mission to enter. They were, of course,  
refused.

The extremely bad weather makes cir-  
culation through the park unpleasant work  
for whoever is obliged to move about in it.  
Not a small amount of trouble has been  
experienced by those who bought goods in  
the Exhibition. When they came to carry  
away their purchases it was discovered that  
there was a tangle of custom-house regula-  
tions to face. To evade these was the  
thought of the hour, and tall hats, umbrel-  
las, overcoat sleeves, ladies' skirts and a  
score of other means were called into service  
in order to avoid detection. But it is nearly  
all over now, and the uppermost question in  
the French mind is what to do with the  
Exhibition building. The idea of making  
an industrial museum of it, of which project  
I have already written you, gains favor and  
strength every day. The Canadian govern-  
ment has given the immense Canadian trophy  
that stood in the north vestibule of the  
Champ de Mars Palace to this museum, now  
in a fair way to be established. As the pro-  
ducts exposed on the balconies of this trophy  
are the property of various private exhibi-  
tors, they are, of course, not included in the  
princely offer, but they will be replaced by  
a much more interesting collection of the  
agricultural and natural products of the  
Dominion. Considered purely as a market-  
able article the established value of the trophy  
is 100,000 francs; as an object of art  
and study its price cannot be estimated.

We are now in the period of gift-giving  
and testimonials. Commissioners and assist-  
ant commissioners count in the front rank.  
M. Berger, director general of the foreign  
sections, was made the recipient of a valuable  
*objet d'art* from the foreign commissioners.  
On the base of this group in silver the  
names of all the donors were engraved,  
"from Sir Cunliffe Owen, commissioner  
general of England, down to M. le Baron  
Morin de Malsabrier, commissioner general  
of the republic of St. Martin," as the even-  
ing journals express it. Mr. Cunliffe Owen  
was the recipient of a testimonial at the  
hands of the British colonial commissioners,  
as well as from the various exhibitors in the  
English section, who at last accounts had  
raised an enormous purse for the man who  
did so much for them. American exhibitors  
did not forget Gov. MacCormick, and take  
it on all sides, everybody seems to be well  
pleased, for it was pretty hard work to  
dodge around among awards, decorations  
and subscriptions that make a man's heart  
lighter and his pocket heavier without strik-  
ing something.

All the special lines of omnibuses and  
trains that were called into existence by the  
exhibition were withdrawn on the 10th. It  
is always easy now to find a place in the  
omnibus or a cab on the street. Coachmen  
have suddenly taken to behaving themselves,  
realizing that their harvest is gathered.  
Hotels are reducing their prices from the  
disgraceful figures of the last six months, and  
the waiters are finding it best to be polite,  
all of which we who have stood the extor-  
tions of the last six months heartily appreci-  
ate. Some of the merchants in the Exhi-  
bition have not yet locked up their cases.  
They are offering their wares at reduced  
prices, hoping to sell them to the exhibitors  
and the attendants. They do not meet with  
much success. But they have gained enough  
and have no reason to complain. In the



## Cutlery.

## FRIEDMANN &amp; LAUTERJUNG,

Manufacturers of PEN AND POCKET CUTLERY,  
Solid Steel Scissors, Shears, Razors,  
Russia Leather Straps, Hones, &c.  
Sole proprietors of the renowned full concave patent  
"ELECTRIC RAZORS,"  
And the celebrated "ELECTRIC SHEARS." Nickel Plated  
Hones.  
Agents for the BENGAL RAZORS.  
AMERICAN TABLE CUTLERY BUTCHER KNIVES, &c.  
91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

## MERIDEN CUTLERY COMPANY.

The "PATENT IVORY" HANDLE TABLE KNIFE.

The oldest manufacturers of Table Cutlery in America. Exclusive makers of the CELLULOID HANDLE  
for Table Cutlery. A most beautiful and perfect substitute for Ivory. Also makers of all kinds of TABLE,  
BUTCHER AND HUNTING KNIVES. Illustrated catalogues with prices sent to the trade on application.  
No. 49 Chambers Street, New York.

THE  
**LAMSON & GOODNOW**  
88 CHAMBERS ST. N.Y.  
MFG. CO.  
AMERICAN TABLE  
CUTLERY &c.

AARON HURKINSHAW,  
Manufacturer of Pen and Pocket Cutlery, Pepperell, Mass. Established 1853.  
My Blades are forged by hand from the best Cast Steel, and warrant-  
ed. To me was awarded the Gold Medal of the Conn. State Agricultural Society.  
Office in New York with E. P. Whipple, 100 Chambers St.

**NAUGATUCK CUTLERY CO.,**  
Manufacturers of FINE PEN & POCKET CUTLERY.  
FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

## HALL, ELTON &amp; CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



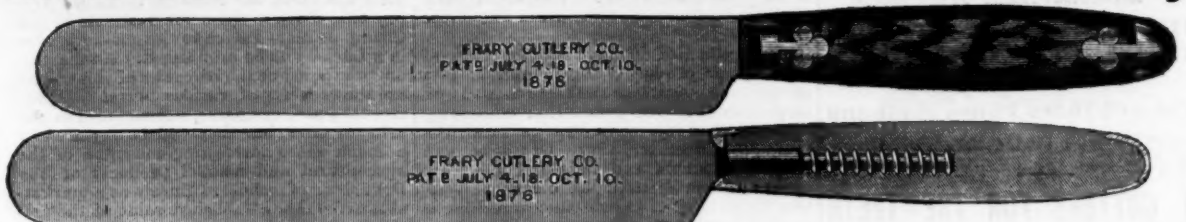
Factories, Wallingford, Conn.

Salesroom, 75 Chambers Street, New York.

## THE FRARY CUTLERY COMPANY,

FACTORY, BRIDGEPORT, CONN.  
NEW YORK OFFICE & WAREHOUSE, with WIEBUSCH & HILGER HARDWARE CO., 84 Chambers St.

## Manufacturers of all kinds of Table Cutlery.



The above illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.

There is no question but that a solid handle knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle  
has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand  
and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent  
screw tang. A wood screw is welded to the tang of the knife or fork, and screwed firmly and securely in the handle and locked there by the bolter, making a very strong  
neat and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butcher and Carvers,  
and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly,  
and very respectfully invite the attention of the trade.

## THE SANDUSKY TOOL CO.,



Schwehr's Patent Forged, Oil Tempered Planter  
and German Pattern Hoes.

Warranted the strongest and best goods made.

GRAHAM & HAINES, General Agents,  
113 Chambers St., New York.

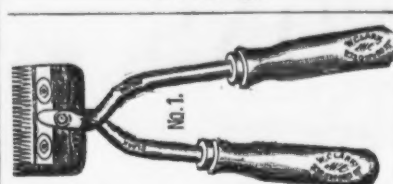
L. M. RUMSEY & CO., General Agents, 811 North Main Street, St. Louis, Mo.



See our advertisement in The Iron Age first issue of each month.

Beardsley Scythe Co.,  
Manufacturers of  
GRASS, GRAIN & BUSH SCYTHES,  
Hay Knives & Corn Knives.  
West Winsted, Conn.

## Cutlery.



**McCoy & Co.,**

134 & 136 Duane Street, New York.

SOLE WHOLESALE AGENTS

CLARK'S

## PATENT HORSE CLIPPER

Five styles. Fully described by our circular and  
price list, which we will send on application.  
The genuine are stamped on both the wooden  
and metal parts, as shown in the illustration, as a  
protection against inferior imitations.  
All repairs executed with care and dispatch.

## HERMANN BOKER &amp; CO.,

101 & 103 Duane Street, New York,

SOLE AGENTS FOR THE

GARDNER PATENT  
POCKET KNIVES

The assortment of Gardner's Celebrated  
Barlow Knives has been increased, and they  
are now furnished with Rubber, Bone, Stag  
and Wrought Iron Handles.

All of Gardner's Patent Knives are fully warranted.

## STANLEY RULE AND LEVEL CO.,

MANUFACTURERS OF

Improved  
Carpenters'  
Tools.



FACTORIES,

New Britain, Conn.

WAREHOUSES,

29 Chambers St.,  
New York.

No. 113, Improved Adjustable Circular Plane - \$4.00

## ALFRED H. HILDICK,

12 Warren St., N. Y.,  
Importer of CHAINS, ANVILS, VISES, &c.

Agency of  
HILL BROTHERS & CO., WALSALL, ENGLAND,  
GENERAL HARDWARE MERCHANTS,  
And of

BALL'S PAT. SOLID STEEL SHEEP SHEARS.

These shears are unsurpassed for cheapness, dura-  
bility and utility. They are made of one solid piece  
of steel from point to point, and cannot be broken in  
use either in the bow or at the junction of the shank  
and blade. Samples can be seen at above address, or  
sample lots furnished.

GEORGE W. BRUCE,  
1 Platt St., New York,

Agent for CLEMENT & MAYNARD'S Trowels, Hoes,  
Shovels, Spades and Scoops. Their Trowels and Hoes  
have entirely supplanted the English by their quality  
and cheapness, while all their goods compare advan-  
tageously with those of other makers and are largely  
exported.

MALTBY, CURTISS & CO., No. 31 Reade St., N. Y.,  
HARDWARE MANUFACTURERS AND MANUFACTURERS' AGENTS.

Sole Agents for the  
NORWICH PISTOL CO.

Send for circular and price list.

CARRIAGE HARDWARE  
AND  
MALLEABLE IRON.

IVES, WOODRUFF & CO., Mount Carmel, Conn.



MICROMETER CALIPER,  
Made by THE VICTOR SEWING MACHINE CO.  
Middletown, Conn.

This attractive and very desirable tool will be  
found more reliable and convenient than the Vernier  
Caliper, and to Machinists and Tool makers it is in-  
dispensable on work requiring very accurate and  
close measurement. Its capacity is one inch, and is  
graduated to one thousandths, but can readily be set  
one-half and quarter thousandths; and is so con-  
structed that any wear resulting from use can be  
readily adjusted.

## MARTIN'S ENGLISH HORSE CLIPPERS.

J. J. Shannon,  
1707 Market St.,  
PHILADELPHIA.



Recommended as  
the best hand Clip-  
per made.  
\$3.50 EACH.  
Extra pieces for  
sale.

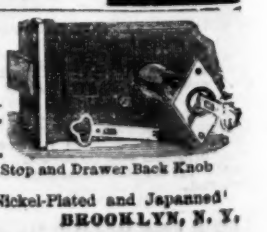
Send for circular.

## Wilson Bohannon,

Manufacturer of Patent

## BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hard-  
ware Trade. All sizes, with Brass and Steel Keys,  
with and without chains.  
Patent Horizontal Rim Cylinder Night Latch.  
Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob  
RIGHT OR LEFT HAND.  
PASSENGER CAR LOCKS, Bronzed, Nickel-Plated and Japanned.  
Catalogues and Samples sent upon application. BROOKLYN, N. Y.



## Young's Patent Folding Scissors.



Having largely increased our facilities for the manu-  
facture of these very popular goods, we offer them to  
the trade at a large reduction from our former  
prices. The list price of the large size is now \$12.00  
per dozen, formerly \$18.00, and the small size, \$8.00,  
formerly \$12.00. The material used in the manu-  
facture of Young's Patent Folding Scissors is the  
very best. All are nickel-plated and furnished with  
a neat morocco case.

MARX BROS., Proprietors,  
430 Broadway, New York.

## I. R. SPENCER &amp; SON,

Albion Steel Works, Sheffield,

MANUFACTURERS OF

## FILES

AND

## STEEL,

Table Knives, Razors, Shovels, &c., &c.,  
of every description.

CORPORATE MARK.

SPENCER  
SHEFFIELD

Granted 1749.

CORPORATE MARK.



## Joseph Rodgers &amp; Sons' (LIMITED)

CELEBRATED CUTLERY,  
No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they  
have, in order to meet it, greatly extended their  
Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers  
& Sons' Manufacture, please to see that they bear  
their Corporate Mark.

## SYRACUSE CUTLERY COMPANY,

Manufacturers of

Pen and Pocket Knives,

Warranted made from

S. & C. WARDLOW'S EXTRA CAST STEEL.

Rear 71 Clinton St., SYRACUSE, N. Y.



## B. KREISCHER & SONS, FIRE BRICK AND CLAY RETORT WORKS.

Established 1845.  
Office, foot of Houston Street, East River,  
NEW YORK.

The largest stock of Fire Brick of all shapes and sizes on hand and made to order at short notice.  
Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

## NEWTON & CO.,

Successor to  
PALMER, NEWTON & CO.,  
ALBANY, N. Y., Manufacturers of

## FIRE BRICK Stove Linings, Range and Heater Linings Cylinder Brick, &c., &c.

## M. D. Valentine & Bro

Manufacturers of  
**FIRE BRICK  
And Furnace Blocks  
DRAIN PIPE & LAND TILE.**  
Woodbridge, - - - N. J.

## A. HALL & SONS, Perth Amboy, N. J. ESTABLISHED 1846. HALL & SONS, Buffalo, N. Y. ESTABLISHED 1866. **FIRE BRICK**

of reliable quality for all purposes, manufactured on the best New Jersey Fire Clays. Also, Architectural Terra Cotta, Fire Clay, Fire Sand, Kaolin, Ground Fire Brick and Diamond Building Brick.

## Brooklyn Clay Retort AND FIRE BRICK WORKS.

Manufacturers of Clay Retorts, Fire Bricks, Gas House and other Tile, Cupola Brick, &c. Dealers in and Miners of Fire Clay and Fire Sand. Clay bank at Burt's Creek, New Jersey. Manufacture: Van Dyke, Elizabeth, Richards and Partition Sts., Brooklyn, N. Y. Office No. 88 Van Dyke St.

## Watson Fire Brick Manufactory ESTABLISHED 1836. JOHN E. WATSON, Perth Amboy, New Jersey. Manufacturer of **FIRE BRICK,** For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c. FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

## HENRY MAURER, Proprietor of the Excelsior Fire Brick & Clay Retort Works, Manufacturer of FIRE BRICK, HOLLOW BRICK AND CLAY RETORTS. WORKS PERTH AMBOY, NEW JERSEY. Office and Depot: 418 to 422 East 23d St., N. Y.

## TROY FIRE BRICK WORKS Troy, N. Y., JAMES OSTRANDER & SON, ESTABLISHED 1848. Manufacturers of **FIRE BRICK,** Tuyeres, Tiles, Blast Furnace Blocks, &c. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

## Established 1864. CARDNER BROTHERS, MANUFACTURERS OF **STANDARD SAVAGE Fire Brick, Tile & Furnace Blocks,** OF ALL SHAPES AND SIZES. Clay Gas Retorts and Retort Settings, AND Miners and Shippers of Fire Clay. Office: 376 Penn Ave., Pittsburgh, Pa. Works: Mt. Savage Junction, Md., and Lockport, Pa.

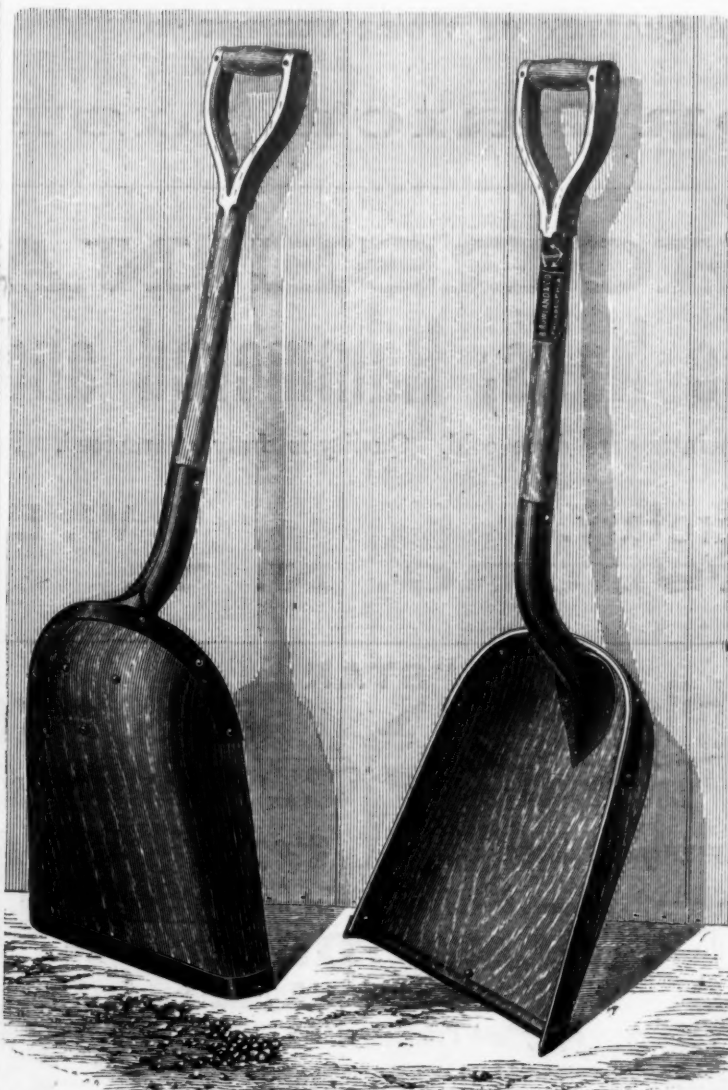
## BORGNER & O'BRIEN, Manufacturers of Fire Bricks, Clay Gas Retorts, Retort Settings, Tiles, Blocks, &c., &c. 23d St., below Vine, PHILADELPHIA. Eighteen years' practical experience. CYRUS BORGNER. WM. J. O'BRIEN

## John Carver, MANUFACTURER OF **CAULKING IRONS,** Cotton, Freight and Hay Hooks, No. 288 Monroe Street, Bet. Jackson & Corlies Sts., NEW YORK.

## TACKLE BLOCKS BURR & CO., Manufacturers of Waterman and Russell's Patent Iron Strapped Blocks. Also, Manufacturers of **ROPE STRAPPED BLOCKS.** 31 Peck Slip, New York.



## B. ROWLAND & CO., PHILADELPHIA.



## B. Rowland & Co.'s Patent Wooden Blade Grain and Potato Scoop.

We would call the attention of the trade to the above new article of our manufacture, and to its many advantages over the Steel Blade Scoop heretofore used for the same purpose, advantages which we think are destined to make it of universal use for the shoveling of grains of all descriptions, as well as for potatoes, apples, etc.: First, as to its weight, which is a little more than one-half that of a steel scoop of the same capacity, consequently it can be handled more rapidly and accomplish more work in a given time; second, as to its appearance—it is more sightly, being of a graceful shape, and constant use has the effect of giving the wood a beautiful hard polish, causing it to penetrate the mass of grain readily and deliver its load promptly. It balances perfectly in the hands, is thoroughly braced and guarded with iron at all exposed points, and is fully as strong and in some respects more durable than the steel scoop used for the same purpose. One trial will insure its future use to the exclusion of all others.

## B. Rowland & Co. CAST STEEL.

All goods of this brand (which is copyrighted) are warranted in every respect.

**B. ROWLAND & CO.,**  
CITY OFFICE,  
27 North Fifth Street, Philadelphia, U. S. A.  
Works at Frankford, Phila., U. S. A.  
NEW YORK WAREHOUSE, 100 Chambers St.

French machine gallery the merchants prosecute their callings with an earnestness that is terrible.

Julian Turgan, who had so much to do with the inception of the Exhibition, in the beginning of a volume just published by Calmann-Lévy, recounts some personal reminiscences concerning its origin that are extremely interesting. His interview with Victor Hugo is one of the best chapters. What happened is characteristic of the great poet of Guernsey. He writes: "Obliged to make a journey in Midi; I departed content to see my project warmly seconded by the journal *La France*. I did not think its realization could come so soon nor be so brilliant. I understood the nature of great men well enough to know how immense concourses of the masses displeased them." In going away from the ministers, thinking by myself, I realized how hazardous my demand had been, but my instinct told me to overcome doubt and to destroy any such apathies. The opinion of friends whom I met did not seem to compass the grandeur and magnificence of the work. Those who found the idea a good one thought it premature.

"The happy thought came to me to go to Victor Hugo. It was 26 years since I had seen him. But he seemed to me to be one who could grasp my meaning. Victor Hugo could not receive me. The Senate called him to Versailles, and the political difficulties of that troublous epoch took up all of his time. I received, however, from him the following letter:

"Versailles, 10 March.  
"I should be happy to have you call upon me any day that will be convenient for you, at nine in the evening, Saturdays and Mondays excepted. I will talk with pleasure of the questions on which you are so well informed, and I shall be charmed to shake your hand."  
"VICTOR HUGO."

"I made no delay in accepting the invitations, and, eager to be in the presence of the great writer, of the divine poet, whose sublime works I with poor Gautier had declaimed, hastened to the Rue Clichy. Victor Hugo received me as if he had seen me only yesterday, and invited me into his parlor, where I found my old friends of the *Écène-met* of 1849, Maurice and Vacquerie. I found there also Dorton See, whom I had known at St. Antoine hospital, and Mr. Ernest Lefèvre, then preoccupied with municipal affairs.

"It was next to impossible for me to speak to Hugo, his time was so taken up by his friends, but he asked me to dine with him on the morrow. After that dinner he took me apart and motioned me to say to him what I wished. He listened attentively. He recalled a voyage made to Lille. He remembered many things long since forgotten by me. He spoke more to himself than to me. I listened without breathing a whisper, enraptured by the charmed words of the master, so simple and touching when he made no effort. He spoke thus a long time, but I did not interrupt. He then arose, went back into his parlor making a gesture of his hand. This particular conversation ceased in a second.

"Hugo said that the exhibition must be. He named Paris, center of the business of the world—Paris, city of the people—that Paris which he loves passionately. He pictured the masses coming from all quarters of the globe to be mutually instructed with us, bringing us the flowers of their production, the result of their labor and industry—bringing all to our great and free Paris. He saw the throng of a hundred thousand together as in a measure, jostling yet calm. Without disturbances, without drunkenness—he saw them all. There might be some pickpockets or some attempts at pocket picking, but no more than in one of our own great retail stores. The poet saw it, and swept all before him by his earnestness. We saw it with him. The cause was definitely won.

"The next day the *Rappel* joined the *France* and the *Petit Journal*. The municipal council preoccupied itself with the Exhibition, and notwithstanding opposition from some of the French and foreign journals that we will not name, one of the first acts of the new ministry was the decree that there would be a Universal International Exhibition in 1878."

This is the way that Monsieur Turgan tells the story.

The Foreign Machinery Hall, from the Canadian trophy at the one end to the Dutch colonial display at the other, is a picture of desolation. It is the most dismal sight on the Champ de Mars, for its glories are flown forever. Up to about a week ago the Machinery Gallery—that stage on which for six months was acted the drama of human skill and ingenuity—had withstood with tolerable firmness the saddening ravages of the demolition. But now it has met the common fate. Along either side of the long hall, in the spaces that were occupied so gloriously during the summer by the pilgrims who made Paris their Mecca, the railroad stares at you with its rusted face. They tore up the flooring and brought the rails into use immediately after the closing, but for a week it amounted to but little besides a stumbling block for the blue-bloused workmen who, after an easy sleep since the first of May or June, had not accustomed themselves once again to the old routine. A half of the machinery has been taken away, and during every hour of the day the rough beams of the roof send back quivering echoes of the hammers that hide from Parisian view the wonders of machinery hall. Locomotives occupy the railway tracks, and their taking away leaves unfilled glaring vacancies in the foreign sections. Shafts are dismounted every hour, and careful artisans put them as quickly as possible out of the way of the clouds of dust that fill every square foot of the space in the vast building. The steam engines, which were our most familiar friends during the days of the fête, have been dismembered and are nearly all gone. The English section, large as it was, is well-nigh packed up. A picturesque and grotesque sight is offered by the various little box offices erected by the British exhibitors at the sides of their exhibits. These now occupy promiscuous positions in the empty alleys or wherever packing straw and machinery cases leave an inch of vacant space. Workmen carry them about on their shoulders or turn them into temporary tool

chests. In the United States section the American printing office, which did very poor work during the Exhibition and charged for it an exorbitant price, was about the last to clear out. It ought to have been the first. The many government charts and models that were so large a portion of the Italian court have all been taken away. The bare partitions have even been torn down. And so it goes on up through the collective mechanical exhibits of Spain, Belgium, Austria, Russia and Holland, in indescribable confusion and chaos. A walk through the alimentary hall that runs at the side of the machinery department, is still more disheartening. If it were not for one or two coarsely boarded partition walls the gallery would seem like a bowling alley. As to the main building it is about as sad a picture as one cares to see. Everything stripped and rough. Everything gone. A few lazy workmen loiter about among the debris. Such is the sight of the "palace" that a few weeks ago was a hive of all that was elegant in industry, science and art.

The museum project gains strength every day, and as it develops promises to preserve about everything on the Champ de Mars except the Pavilion of the city of Paris. The papers say that the famous Avenue of the Nations, with its gaunt façades will be left intact. If this be true, then another monument will be added to the already long list that places Paris near the head in the tourist's list of European cities.

I told you a week or two ago of the grand final testimonial fever. Since writing that letter Mr. Thomas R. Pickering, the superintendent of the United States machinery section, has been presented with a piece of bronze that Tiffany & Co. selected from the French section. Mr. Theo. Bergner made a speech in behalf of the exhibitors, thanking him "for the many good and tried qualities" that he showed in the administration of the position of superintendent of the machinery and agricultural department. "We have been taking lessons," said Mr. Pickering in his speech of acknowledgment. "We have made many mistakes at this Exhibition; we have graduated, and with honors. Never has a nation of exhibitors fared better in regard to awards, business transactions, and prospects for future trade, and never has a commission had more reason to feel proud of its exhibitors, its exhibits, and of the part it has taken in an exhibition than has the United States Commission in the part it has taken in the great Exhibition of 1878, at Paris."

### Labor Notes.

The unfortunate coal miners' strike at the Norton (Ky.) Iron Works' Star Cold Mines, which commenced on the 11th of October, has certainly proved a most lamentable calamity to the prosperity of some 400 laborers and their families, as the works have decided not to move a wheel until the trouble is ended. The 50 coal miners struck for a monthly pay day and lower store prices, both of which the company refused, and when no end to the trouble then arising could be seen, blew out their furnace and stopped their rolling mill and nail mills. The company is now endeavoring to obtain possession of their miners' houses in the civil law process, having issued four 10 days' and four 30 days' notices; these trials will be considered test cases.

The miners of the Middle Lehigh Coal Company struck last September for an advance of 10 per cent. in wages beyond what other operators were paying in the same neighborhood. The price of coal not warranting such an increase, the colliery has been idle ever since. This, with a loss of two months early in the year, owing to the low price of coal, caused the landowners to obtain judgment for themselves and other creditors, under which the company's property will be sold. The company does not owe anything for wages and very little for supplies, and hence no loss is likely to fall upon business creditors. The greatest loss will be to the workmen, who, with winter upon them, have deliberately driven from their locality a monthly disbursement of nearly \$20,000. The company, whose offices are in Mauch Chunk, was organized in 1873, and has given employment to 400 men.—*M. C. Democrat*.

About 600 hands are now employed by the Howe Sewing Machine Company, Bridgeport, Conn.

There are no surface indications of an early settlement of the differences between the flint glass manufacturers of Pittsburgh and the workmen. The employers resolutely adhere to their determination to resume operations only upon unconditional submission to the terms proposed by them, while the workers seem equally firm in their refusal to yield. The hope has been indulged that the "lock-out" would not extend beyond the close of the holidays, or that the first week in the new year would witness the starting up of the eleven factories now idle, but inquiry by our reporter among those best informed in the matter does not justify such anticipation. On the contrary, there is a probability of the situation being aggravated by the manufacturers deciding to insist upon a reduction in wages to the extent of 12½ per cent. This is under consideration by them, and while no conclusion has been reached or formal expression given, a number of them were free to say that if the stoppage was prolonged over a period of months such reduction would undoubtedly be insisted upon.

Nearly all the collieries owned and operated by the Philadelphia and Reading Coal and Iron Company resumed work Monday morning, the 9th inst., with prospects that it will continue until Christmas, probably to the New Year. It is rumored that the miners in the employ of the Philadelphia and Reading Company have agreed to demand wages on the \$2.50 basis, and no sliding scale. If this be so, it means a strike all along the line in the near future.

The Hazel Dell Colliery, which has been hitherto worked by G. M. Provost, and the product shipped by the Philadelphia and Reading Railroad, was last week sold to the Lehigh Valley Coal Company, and the product in future will be added to the tonnage of the Lehigh Valley Railroad Company.



# H. D. SMITH & CO.,

## Plantville, Conn.,

Manufacturers of the

## BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

## SARANAC HORSE NAIL CO.

### Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Secretary.

J. W. LYNDE, Treasurer.

PLATTSBURG, N. Y.

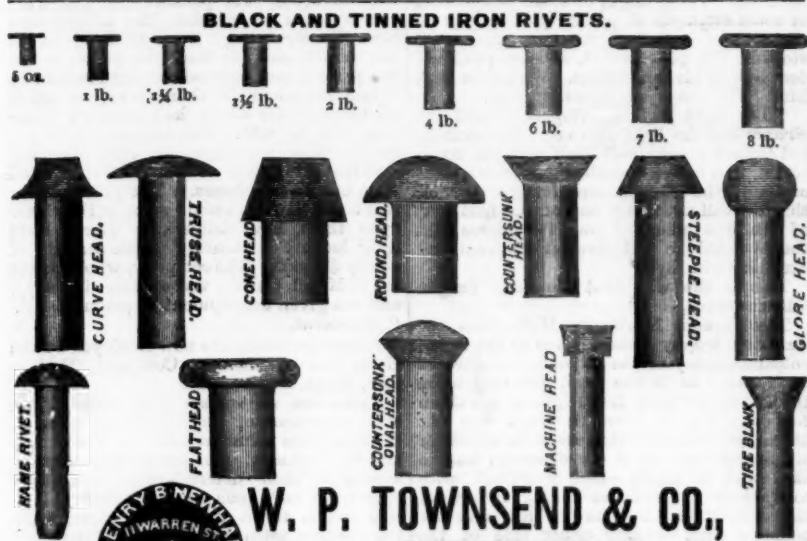
### HAYDEN & SMITH,

#### Auburn, N. Y.,



Manufacturers of  
Carriage and Saddlery Hardware,  
Owners of  
LAMPS PATENT  
Seat Fasteners.

The Safest and only reliable Seat Fastener for Wagons.



W. P. TOWNSEND & CO.,  
PITTSBURGH, PA.,

Manufacturers of every description of First Quality

RIVETS.

### PAYSON & CO.,

MANUFACTURERS OF

## BUILDERS' HARDWARE.

OFFICE AND FACTORY,

1319 to 1325 West Jackson St.,

CHICAGO.



No. 7, Plain, Nickel-Plated.

EMPIRE FORGES

IMPROVED without Belts, Bellows, Crank Pins, Dead Centers or Back Motion. Send for circular. EMPIRE PORTABLE FORGE CO., COHOS, N. Y.

### Philadelphia "STAR" Bolt Works.

NORWAY IRON

FANCY HEAD BOLTS,

Carriage & Tire Bolts. Star Axle Clips, &c.

TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa.

### RICHARD DUDGEON,

No. 24 Columbia Street, New York,

Maker and Patentee of the Improved

Hydraulic Jacks

AND

Punches.  
Roller Tube Expanders and Direct Acting Steam Hammers.  
Communications by letter will receive prompt attention.  
Jacks for pressing on Car Wheels or Crank Pins made to order.



Bemis & Call Hardware & Tool Co.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfield Mass.



### THE Scandinavian or Jail Pad-Lock,

MANUFACTURED BY THE

## CONESTOGA LOCK WORKS,

Lancaster, Pa., U. S. A.

EZRA F. LANDIS, Sup't.

All these Locks are now made with drilled pipe keys and wrought-iron shouldered shackles, which makes the Locks thoroughly water-proof, besides rendering them perfectly secure, as the cap cannot be driven off. They are offered to the trade as the best finished and most superior Jail Locks now in the market. They are furnished in five different sizes (see cut full size), packed in boxes of half dozen, and each Lock furnished with two keys.

With improved machinery, especially adapted for their manufacture, and using none but the very best Malleable and Wrought iron, we can furnish these Locks at prices more satisfactory, besides furnishing a neater and more complete article, than has heretofore been offered to the trade. Discounts Liberal. Correspondence Solicited.

These Locks cannot be picked, each combination being separate and distinct from every other. They combine greater strength, durability, economy and safety than any other pad-lock in the market.

Manufacturer of Improved

## "ECLIPSE" FAN BLOWER.

### A. F. PIKE,

#### East Haverhill, - New Hampshire,

#### Manufacturer and Wholesale Dealer in

#### Scythe, Axe, Knife and Hacker

#### STONES.

Factories at Haverhill and East Haverhill, N. H., and  
Evanston and Westmore, Vt.

Genuine OLD RELIABLE,  
INDIAN POND (Red Heads),  
LA TOILE,  
DIAMOND GRIT,  
WHITE MOUNTAIN,  
PREMIUM  
GREEN MOUNTAIN,  
MOWING MACHINE,  
RAGG.  
Stones gotten up and labeled in  
any style desired.  
PAID AND QUALITY GUARANTEED.  
All the above Stones are of good  
keen grit and will not glaze.

### CLOTHES WRINGERS.



"EUREKA"  
WRINGER.  
BOSTON.

T. J. ALEXANDER, Manager,  
BOSTON, MASS.

### The Patent Combined Dinner-Pail and Lantern.

The most perfect Dinner Pail  
in the world. Hot coffee for  
dinner and a Lantern at night.  
Manufactured by JOS. HAUGHT,  
PORT CHESTER, N. Y.  
Sent by express on receipt of  
\$1.00. Special attention given  
to export orders. Traveling  
Agents Wanted.



# NELSON LYON,

SOLE MANUFACTURER OF

## LYON'S PATENT METALLIC HEEL STIFFENERS

Albany, N. Y.



Old Boots and Shoes can be Straightened

AND  
NEW ONES KEPT STRAIGHT  
BY USING

LYON'S PATENT METALLIC HEEL STIFFENER.

These can be applied to any Boot or Shoe at any time by any one.



Every Pair is warranted to bend to fit the boot without breaking.



All Boxes must be marked, Manufactured only by NELSON LYON, Albany, N. Y., under Patents of July 9, 1872, May 18, 1875, July 11, 1876.

Send for Catalogue.

NELSON LYON.

### A. S. ROBINSON & CO.,

Albany, N. Y.,

SOLE MANUFACTURERS OF THE

## VICTORY Combined Snow Shovel and Ice Pick.

Manufactured under Patents of July 10th, 1877, May 7th, 1878.

As seen in the accompanying cut, the handle can be taken from the blade by throwing back the cam lever which holds it. On the end of the handle there is a steel point which makes a good Ice Chisel.

Catalogue sent on application.



A. G. COES & CO.

WORCESTER,

MASS.,

Successors to

L. & A. G. Coes,

Manufacturers of

THE GENUINE

COES

## Screw Wrenches.

PATENTED,

May 2, 1871.

December 26, 1871.

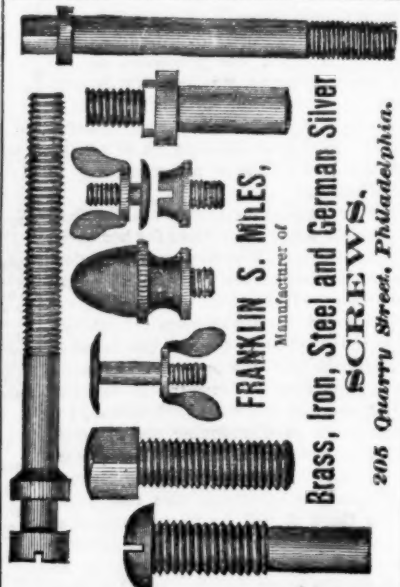
December 28, 1875.

August 1, 1876.

The back strain when the wrench is used is borne by the bar—not by the handle. The strongest Wrench made, and the only successful Re-enforced Bar. None genuine unless stamped

A. G. COES & CO.,

Our Agents, GRAHAM & HAINES, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.



N. Y. MALLET and HANDLE WORKS



Manufacturers of  
Calkers', Carpenters', Stone Cutters',  
Tin, Copper and Boiler Makers'  
**MALLETS,**

Hawing Beetles, Hawing and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles. Also  
**COTTON AND BALE HOOKS.**  
Patented Feb. 13, 1877; a new combination of Hooks.  
456 E. Houston St., New York City.

THE PRATT & WHITNEY CO.,

Hartford, Conn., U. S. A.,

Make specialties of

## DROP HAMMERS,

Punching Presses, Hand Drilling Machines, Ratchet Drills, Combination Lathe Chucks, Cutters for Teeth of Gear Wheels, Screw Plates, Hand, Machine, Nut and Pipe Taps, Bolt Cutters, &c., &c.

## R. COOK & SONS,

Manufacturers of

## Carriage & Wagon AXLES,

WINSTED, CONN.

ESTABLISHED 1839.

## W. & J. TIEBOUT,

Manufacturers of

## Brass, Galvanized & Ship Chandlery Hardware,

No. 390 Pearl Street, New York.

### Scientific and Technical Notes.

Zinc is generally used for producing hydrogen on a large scale, but recently a

**NEW METHOD OF MAKING HYDROGEN** has been suggested by Dr. Kollmann of the Berlin School of Mines. He states that the gas can be easily produced and at a lower price from ferromanganese by treating it with sulphuric acid.

Messrs. Fouqué and Levy, in a communication to the French Academy of Sciences, state that they have been successful in **MAKING FELDSPAR CRYSTALS ARTIFICIALLY**, the varieties crystallized being oligoclase, labrador and albite. The process consists in fusing the feldspar in a platinum crucible placed in a Schliessing furnace, then placing the button before a Bunsen burner, which keeps it for eight hours at a temperature slightly below that of fusion. Under the influence of that sort of annealing the vitreous mass changes in structure and crystallizes with all the details of form of natural minerals.

An interesting experiment was recently made at Glasgow in

**CLEANING THE BOTTOMS OF IRON VESSELS**, the steamship Flying Sylph serving for the trial. The apparatus, known as the Archimedean revolving brushes, is the invention of Mr. Cutlan of London. It is self-acting, being worked by a screw, the revolutions of which are regulated by the speed of the vessel. A line is rove through a block at the martingale end and fastened to the machine. Another line from each side is attached, and having been lowered under the vessel's fore-foot, is hauled from the keel to the water's edge. In this way each side of the ship is overtaken in sections. The brushes are made right and left, so as to strike the vessel with the current and clean away all grass and slime without injuring the paint. A correspondent of *Engineering* states that the trial was highly successful, and was pronounced very satisfactory by many ship owners.

It is stated that the best method of **GIVING TIN PLATE A HIGH POLISH** in the process of manufacture is to cool the plate rapidly, by means of a current of cold air at the moment when the plate is drawn out of the tin-bath.

P. Schützenberger has published in the *Comptes Rendus* his researches on the

**CHEMICAL COMPOSITION OF WOOL**, according to which its formula would be:

C<sup>230</sup> H<sup>381</sup> N<sup>170</sup> O<sup>17</sup> S<sup>8</sup>.

Fr. Koepe, of the Hanover coal mine, at Bochum, Germany, is the inventor of an

**IMPROVED HOISTING PLANT**

for mines, founded upon the happy thought of replacing the two hoisting drums with its two separate ropes by a single sheave with one wire. The circumference of this sheave, which is much cheaper than the ordinary hoisting drums, is provided with a wedge-shaped groove lined with wood or leather. The weight of the two hoisting cages above will suffice to prevent slipping. The machine may either be placed directly above the shaft or it may be put up beside it. By the arrangement cited one-half of the length of rope is saved and any overwinding becomes impossible, because when one cage is at the pit's mouth the second rests upon the bottom of the shaft, and any further winding would tend to make the rope in the shaft slack, which the counterweight of the cage rapidly puts an end to. If a rope is attached to the bottoms of the two cages and run over a pulley at the bottom of the shaft, complete counterbalancing of the weight of the rope is effected.

The *Fortschritte der Zeit* gives the following solutions for

**STAINING WOOD.**  
Wood may be stained brown by a concentrated aqueous solution of permanganate of potash. *Red.*—Boil ¼ lb. of logwood and ½ oz. of soda in 1 pt. of water; apply it hot, and then wash it over with a strong aqueous solution of alum. *Rose.*—Iodide of potash in 12 parts of water for a first coat, and corrosive sublimate in 40 parts of water for a second. *Blue.*—Indigo solution, or a concentrated hot solution of blue vitriol, followed by a dip in a solution of washing soda. *Yellow.*—Turmeric, dissolved in wood naphtha, or aqua regia in 3 parts of water. *Green.*—Verdigris, dissolved in 4 parts of water.

A pump, which seems to have been working for almost two years successfully, has been described recently by Chiazzari, of the Alta Italia Railway. It is used for

**FEEDING LOCOMOTIVE BOILERS WITH HOT WATER**

heated to within a few degrees of the boiling point. It consists in bringing the feed-water in a finely divided spray into contact with a portion of the exhaust steam during its passage through the feed-pump, and of an automatic arrangement for shutting off the supply from the tender the moment the regulator is closed, thus preventing the admission of cold water to the boiler.

Prof. Palmieri, of Naples, has constructed an apparatus for

**TESTING THE PURITY OF OILS** by means of the resistance which they offer to the passage of electricity. He takes olive oil, the poorest conductor of all, as a standard of comparison. It is stated that the apparatus may also serve to reveal cotton in silk fabrics, because small amounts of the former in the latter greatly increase the conductivity.

Messrs. Ducrotet & Co., of Paris, have exhibited at the recent Exhibition what is claimed to be

**THE LARGEST MAGNET IN EXISTENCE.** It is a Faraday electro-magnet, the coils of which have a diameter of 19.7 inches and a height of 23.6 inches. The total weight is 2193.6 pounds. The helices are made up of numerous parallel and separately-insulated wires, in order to facilitate different combinations, both in tension and in quality.

A German—Mr. Fleischen, of Dessau—has patented a vessel propelled by the direct action of steam on water, which has been called the

**HYDROMOTOR.**

According to the *English Mechanic* the apparatus consists mainly of two steam-tight

water holders with outflow pipes, which open outside, partly backward, partly sideways and forward. From these holders the water is alternately forced by steam, the entrance of which is automatically regulated by means of floats. When a holder is emptied the steam admission valve is closed, and an outlet valve opening lets the steam present into a condenser. Through the consequent rarefaction water is drawn into the vessel, which, by its float, again opens the steam admission valve and the process begins afresh. The two holders work alternately, but independently of each other. The water forced out backward drives the vessel forward with a velocity which is at best equal to half the velocity of outflow. The axial chief pipe and the lateral pipes for steering are worked by means of levers from the steering platform. The engineer has merely to attend to the working of the apparatus through the principal steam valve, and is guided by manometers and vacuum meters. The arrangement is such that the expansion of the steam can be varied at will. To prevent condensation of steam in the holders, these are recommended to be lined inside with wood; also the walls are oiled by a layer of oil floating on the water's surface.

In the course of some recent experiments Mr. Naumann has discovered indications of a **NEW MODE OF DETERMINATION OF MOLECULAR WEIGHT**

which is specially applicable to substances which, in the pure state, are not volatile without decomposition. In studying the distillation of liquids which cannot be mixed with water, by a current of aqueous vapor at constant boiling temperature, he has found that the quantities of two liquids passed in distillation and estimated in molecular weights, are in the same ratio to each other as the tensions of vapor of these liquids measured at the constant temperature at which distillation is effected.

Modern industry has become so specializing that for various uses the

**COMPOSITION OF BRONZES FOR MACHINERY** is made to vary to meet the requirements of each special case. In the following we give the composition of these alloys as used by prominent French departments:

| French Marine.                               | Copper. | Tin. | Zinc. |
|--|---------|------|-------|
| Tough bronze for rods, valves, cock, &c.     | 88      | 12   | 0     |
| Very tough bronze for eccentric straps, &c.  | 90      | 10   | 0     |
| Bronze for plunger blocks                    | 85      | 14   | 0     |
| Hard bronze                                  | 84      | 15   | 0     |
| Very hard bronze for sheave brass cocks      | 82      | 18   | 0     |
| Bell bronze                                  | 78      | 22   | 0     |
| Anti-friction bronze (with 5 parts antimony) | 4       | 95   | 0     |

| French Railroads.               | Copper. | Tin. | Zinc. |
|---------------------------------|---------|------|-------|
| Car pillows                     | 82      | 18   | 0     |
| Locomotive and tender oil boxes | 84      | 15   | 0     |
| slide valves                    | 82      | 18   | 0     |
| Cocks                           | 88      | 12   | 0     |

The bronze composed of 86 copper, 14 tin and 2 zinc is least porous, and therefore is most suitable when pressure is to be resisted.

At the late meeting of the British Association, Mr. W. Willis read a paper describing a method for making

**PHOTOGRAPHIC PLATINUM PRINTS UPON PAPER,**

in the shape of an impalpable powder, in which its color is intensely black. As platinum, even in this state, resists atmospheric influences, photographs so made would be unalterable. His method consists of coating paper with a mixture of oxalate of iron and chloride of potassium and platinum, which, after being dried, is exposed to light under a negative. After it has had a sufficient exposure it is floated on a hot solution of oxalate of potassa and a platinum salt. This immediately develops the picture. After washing with water and drying, the print is finished.

A simple contrivance for

**CONVERTING COMMON SHELLS INTO INCENDIARY PROJECTILES,**

has been successfully tried at the Woolwich Arsenal. The shell is charged with pieces of port-fire or star composition rod, each piece about 3 inches in length, and gunpowder is then poured in to fill up the interstices and form the bursting charge. On being fired into a building or into the midst of an ammunition train the charge is ignited by a time or percussion fuse, and the shell not only bursts into a hundred fragments, scattered in all directions, but distributes more than a hundred flaming port-fires, each burning fiercely for a sufficient time to ignite any inflammable object with which it may come in contact. The ordinary field-gun projectiles have been used in this way as well as the high-flying shells of the 6.3-inch howitzer, and both have answered well.

A French railway contractor, M. Lostal, recommends

**QUICKLIME AS A PRESERVATIVE OF TIMBER.**

He puts railroad sleepers, for instance, into pits and covers them with quicklime, which is slowly slaked with water. Timber for mines must be left for eight days before it is completely impregnated. It becomes extremely hard and tough and is said never to rot. Beechwood, prepared in the same manner, has been used in several iron works for hammers and other tools, and is reputed to be as hard as iron, without losing the elasticity peculiar to it. According to the *Kurze Berichte*, lime slaked in a solution of chloride of calcium is used at Strassburg as a fire-proof and weather-proof coating for wood.

It has been repeatedly claimed that

**DEPRIVING MINERS OF SOLAR LIGHT**

injuriously affects their health. This point has recently engrossed the attention of Dr. Favre at the Commeny collieries. He does not think that the mortality of miners must be attributed to the action of the deprivation of solar light upon the blood, and cites by way of confirmation that he examined the blood of certain of the horses which were kept underground all the year, and he found the normal number of corpuscles in the blood.

An English paper speaks of

**WEAVING SLAG WOOL**

as a thing accomplished in that country by Messrs. Jones, Dale & Co. Strips and sheets are made of it which, it is claimed, do very well for wrapping steam pipes.



# The Iron Age

AND  
Metallurgical Review.

New York, Thursday, December 19, 1878.

DAVID WILLIAMS, Publisher and Proprietor.  
JAMES C. EAYLES, Editor.  
JOHN S. KING, Business Manager.

## RATES OF SUBSCRIPTION INCLUDING POSTAGE.

IN THE UNITED STATES, BRITISH AMERICA AND  
SANDWICH ISLANDS.

Weekly Edition: \$4.50 a year.  
Issued every Thursday morning.  
Semi-Monthly Edition: \$2.30 a year.  
Issued the First and Third Thursday of every month.  
Monthly Edition: \$1.15 a year.  
Issued the First Thursday of every month.

### TO ALL OTHER COUNTRIES.

PER ANNUM, POSTPAID.  
Weekly Edition: \$5.00—£1=25 francs=20 marks=12  
florins=5 roubles (coin)=3 lire=20 pesetas.  
Semi-Monthly Edition: \$2.50=10/6=12½ francs=10  
marks=6 florins=3 roubles (coin)=12½ lire=10 pe-  
setas.  
Monthly Edition: \$1.25=5/3=6¼ francs=5 marks=3  
florins=1½ roubles (coin)=6¼ lire=5 pesetas.

REMITTANCES  
should be made by draft, payable to the order of David  
Williams, on any banking house in the United States  
or Europe; or, when a draft cannot be obtained, the  
amount may be made up in the postage stamps of any  
country.

NEWSDEALERS OR BOOKSELLERS  
In any part of the world may obtain *The Iron Age*  
through the American News Company, New York, U.  
S. A.; the Wilmer & Rogers News Company, New  
York, U. S. A.; and London, England; or the San Fran-  
cisco News Co., San Francisco, California, U. S. A.

RATES OF ADVERTISING.  
One square (12 lines, one inch), one insertion, \$2.50;  
one month, \$7.50; three months, \$20.00; six months,  
\$35.00; one year, \$60.00; payable in advance.

DAVID WILLIAMS, Publisher.

83 Rensselaer Street, New York.

PITTSBURGH: 37 Fourth Avenue

JOSEPH D. WILSON, Manager and Associate Editor.

PHILADELPHIA: 200 South Fourth Street

THOMAS HOSKINS, Manager.

CINCINNATI: Merchants' Exchange

T. T. MOORE, Manager.

CHATTANOOGA: Eighth and Market Streets

S. B. LOWE, Manager.

BRITISH AGENCY.

The publishers of *The Iron Age*, 44 Cannon Street,

London, England, will receive orders for subscriptions

and advertisements on our regular terms.

AUSTRALIAN AGENCY.

The American Hardware Company, Melbourne, are

our agents for Australia. Sample copies will be mailed

by them, free of charge, to any firm engaged in the

trade we represent in Australia, Tasmania and New

Zealand.

## CONTENTS.

First Page.—Clayton's Air Compressor.  
English Views of American Competition. Work-  
ingmen in France. The Chemical Composition  
and Physical Properties of Steel Rails.

Third Page.—New Patents.

Fifth Page.—The Iron Interests of Ohio. The  
History of the Buckle. The Channel Tunnel. A  
New Cunarder.

Seventh Page.—A Consular Report from the  
Rhine Provinces.

Ninth Page.—The Paris Exposition.

Eleventh Page.—The Paris Exposition. (Con-  
cluded). Labor Notes.

Thirteenth Page.—Scientific and Technical  
Notes.

Fourteenth Page.—The Reciprocity Idea in  
England. Fluctuations in Brazilian Trade.

Fifteenth Page.—Two Government Rolling  
Mills. Restricting the Production of Iron. Death  
of Samuel T. Reeves. Funeral of the late Burton  
Mallory. Some Severe Comment. A Canadian  
View of Free Trade. Serious Failures of Iron  
Dealers. Another Failure. Glass Items. The  
Business of One Firm.

Sixteenth Page.—The Cotton and Wheat  
Crops. The Glass Makers' Strike.

Seventeenth Page.—Trade Report. General  
Hardware. Iron. Metals. Coal.

Eighteenth Page.—Old Metals. Paper Stock.  
Hats. Imports. Exports. Philadelphia. Pittsburgh.

Nineteenth Page.—Chattanooga. Boston.  
Cincinnati. Louisville. St. Louis. Baltimore.  
Foreign. Our English Letter.

Twentieth Page.—Industrial Items. Mining  
and Mineral Items.

Twenty-first Page.—The Iron Age Direc-  
tory.

Twenty-second Page.—New York Wholesale  
Prices.

Twenty-third Page.—New York Wholesale  
Prices. (Continued).

Thirty-first Page.—Philadelphia, Buffalo,  
Chicago and Pittsburgh Hardware and Metal  
Prices.

Thirty-third Page.—Boston and St. Louis  
Hardware and Metal Prices.

Our readers will remember the mission of  
a French gentleman to this country last  
summer to create a sentiment in favor of a  
treaty of commerce and the meetings held  
in its interest at the Paris Exposition. By  
authority of the French government a series  
of meetings are being held all over France  
to promote this treaty, and if addresses and  
resolutions could have made it an accom-  
plished fact the treaty would have been rat-  
ified months ago. But it has not yet been  
made to appear what we are to gain by such  
a treaty. What equivalent is to be offered for  
the removal of duties on the production of  
that country sent to us? The reciprocity,  
to use an old simile, is like the handle of a  
jug—all on one side. The advocates of the  
scheme seem to think that they have only  
to gain the consent of the French people to  
it, but they will soon discover their mistake.  
The California Constitutional Convention is  
the first representative body to take formal  
action, and they have adopted a memorial  
to the President and Congress against the

treaty as being prejudicial to the agricul-  
tural interests of that State. We repeat  
the statement that we have so often made,  
that the tariff sentiment of the country was  
never stronger than it is to-day. In some  
sections which owe their prosperity to the  
tariff, New England, for example, free trade  
may have become more popular, but in the  
West, in the agricultural region, where the  
free-trade sentiment has popularly been sup-  
posed to be the strongest, protection is gain-  
ing ground every day, and this action of  
the California Convention is a virtual com-  
mitment of that State to protection, since  
if she expects the duties to be retained on  
wines, brandies, raisins, raw silks, &c., she  
must be willing to join hands with other  
sections to protect their industries.

### The Reciprocity Idea in England.

Human experience is continually verify-  
ing the proverb which has long passed cur-  
rent in police circles—"The things least  
expected are the ones most likely to  
happen." We were forcibly reminded of  
this by reading in the editorial columns of  
our valued English contemporary, the  
*Ironmonger*, of Nov. 23d, an article entitled,  
"Free Trade and Reciprocity." That so  
starch and consistent an advocate of  
"broad principles" should have so far  
fallen from politico-economic grace as to  
concede that free trade can be a failure  
under any conceivable conditions, is cer-  
tainly to be classed among the unexpected  
happenings. The *Ironmonger* is not a jour-  
nal of radical tendencies. It has always  
been careful to represent, rather than ambi-  
tious to shape, the opinions of its large and  
influential constituency, and when we find  
it changing front on the question of free  
trade and boldly advocating the abandon-  
ment of the commercial policy which British  
economists have proclaimed to be the basis  
of British industrial and commercial great-  
ness, we feel warranted in concluding that  
the *Ironmonger* is only giving expression to  
the opinion of a respectable proportion of  
those whom it represents with such consci-  
entious fidelity.

We are not inclined to make ourselves  
disagreeable to our English readers by cry-  
ing, "I told you so;" but it is well to re-  
member at this time that the intelligent de-  
fenders of protection have always insisted  
that the British nation adhered to free trade  
not because it was a matter of principle, but  
because it was believed to be in the largest  
degree conducive to the industrial and com-  
mercial interests of the nation, and that as  
soon as it was found that protection was  
likely to be more profitable than free trade, it  
would be demanded by the people and con-  
ceded by the government. It was not to be  
expected, however, that such a change  
would be brought about suddenly, or that  
those who shape and direct public opinion in  
such matters would step from one extreme  
to the other. The strongly conservative ten-  
dency of British thought would not permit  
such a change of base, and those who hon-  
estly believe that free trade is a failure and  
protection a necessity, have been shrewd  
enough to stop at the half-way house of re-  
ciprocity. There is a deal of worldly wisdom  
in this policy which is highly commendable.  
It accomplishes its object without arousing  
any very vigorous opposition. The argu-  
ment may be briefly paraphrased thus: Of  
course free trade is the only natural and  
legitimate basis for international com-  
mercial relations, and the nations which  
have departed from this faith and  
sought to develop and diversify their  
industries by protecting them, are fools.  
At the same time we have to deal  
with the uncomfortable fact that in our ad-  
herence to sound views of political economy  
we stand alone. The markets of the world  
are closed against our manufactures by tar-  
iffs, while our markets are open to all the  
world. This gives other nations an unfair  
advantage. Unfortunately we are not in a  
position to treat them as we treated China  
a few years ago, and our protests have  
passed unheeded. Let us show them the  
value of free trade by adopting a policy of  
retaliation, imposing a protective tariff on  
all classes of imports, and then making ex-  
ceptions in favor of those nations which are  
willing to negotiate with us for reciprocity.  
In this way we shall punish their folly and  
in a few years force them to return to the  
true faith and open their markets to us in  
exchange for like privileges in our markets.

Thus presented, the argument is very  
specious and takes well with all classes.  
The British people have never been averse  
to "wars of the yard-stick," and here is a  
chance for such a war without the prospect  
of bloodshed or any considerable increase in  
the public debt. Consequently the idea of  
reciprocity is gaining ground, and the na-  
tion is steadily drifting in a direction which  
must occasion the apostles of free trade se-  
rious alarm.

In the case of the *Ironmonger* we do not  
discover any disposition to advocate protec-  
tion as a principle, but it is interesting to  
note how, almost unconsciously, it abandons  
to the enemy some of the strongholds of the  
free-trade argument and turns its guns upon  
the popular convictions and prejudices which  
the advocates of protection are seeking to  
batter down. For example, no argument  
has been offered or more persistently urged  
by free traders than that a tariff is a tax on  
the consumer. The changes that have been  
rung on this idea are innumerable. Orators  
in England at the hustings and orators  
in this country on the stump, have por-  
trayed to the honest voter the oppressive

burdens he was forced to carry by reason of  
the tariff. They have figured up how much  
the coat on his back and the shoes on his  
feet were increased in price by the tariff,  
and have conclusively proved to their own  
satisfaction that the tariff was a tax on the  
consumer. Protectionists, on the other  
hand, have insisted that while for a time  
the result of a tariff might be to somewhat  
increase the cost of goods to the consumer, in  
the end it cheapened them, and finally that  
the tariff was a tax paid by the producer;  
that is, if England sent her manufactures to  
us she must pay the duty. See how our  
English contemporary abandons the free-  
trade and adopts the protectionist argument.  
It says: "We alone of all the great coun-  
tries remain steadfast and rigid adherents  
to the broad principles of free trade, charg-  
ing but few import duties on any kind of  
foreign produce, yet content, as a nation,  
to pay for almost every article we consign  
to ports other than our own." Under the  
new dispensation it seems that Great Britain  
pays the duties, or at least part of them.

The most refreshing portion of this article  
is an extract from a letter of Mr. David  
MacIver, of the Cunard line. Mr. MacIver  
is a "reciprocity" and the scheme which he  
and those who think with him propose was  
given in our English letter last week.  
The *Ironmonger* commenting on this scheme  
says: "Supporting the views thus enun-  
ciated, Mr. MacIver makes use of plain  
and forcible language in stating his case  
—or rather that of the reciprocity theory.  
He believes that the foreign colonial  
tariffs, if continued long enough, are  
not merely injurious to our home in-  
dustries, but will come to mean the  
"absolute extinction—so far as manu-  
factures are concerned—of our export  
trade." If Mr. MacIver means that so far  
as a protectionist nation is concerned En-  
gland's export trade to that nation of articles it  
can manufacture will be stopped, he is right,  
and that has been the protection argument  
all along. We quote further: "Beginning  
with this startling assumption, Mr. Mac-  
Iver goes on to say that he does not think  
that foreign nations or our colonies are  
likely to modify those tariffs to our ad-  
vantage, believing, as he says he does,  
that not only are the protectionist nations  
not such fools as British political econo-  
mists would assume them to be, but that  
they are perfectly able to judge, without  
our assistance, whether free trade does or  
"does not suit them." We should hardly  
expect an Englishman to make this acknowl-  
edgment. England has proceeded on the  
assumption, so far as this country is con-  
cerned, that we were densely ignorant of  
economic principles, and has regarded it as  
her duty to try to educate us to a fuller  
knowledge and a clearer understanding of  
these principles.

Whether retaliatory tariffs are the best  
thing for England, is a matter for her to  
decide for herself. That they are less defen-  
sible than protective tariffs is no argument  
against them. If England chooses to favor  
one nation and discriminate against another,  
she has the right to do so, and the result of  
this policy she must be prepared to accept.  
In fact, this question of free trade or protec-  
tion is a national one, not international; but  
when it comes to abandoning the principle  
of what is known in the treaties of com-  
merce as the "most favored nation clause,"  
and adopting as a principle this retaliatory  
idea, we think it will be found neither so  
wise nor pleasant as to adopt a straightfor-  
ward tariff which shall be equal to all  
comers on the same article. Still, if Eng-  
land chooses retaliation we have no cause or  
right to complain. It will be interesting to  
study its effects on the price of breadstuffs,  
dairy products, meats and petroleum, which  
form the bulk of our exports to England.  
Probably she will class them as raw materi-  
als, and enter them duty free or at nominal  
rates. If so, her retaliation will not amount  
to much so far as we are concerned; if not,  
it will amount to a good deal as affecting  
some millions of her own people, who can  
just now ill afford to have anything com-  
mon between them and the foreign food supplies  
upon which they are largely and necessarily  
dependent.

One would hardly expect to find good  
tariff arguments in the columns of the  
*Springfield Republican*. It is a journal that  
believes in political economy according to  
Adam Smith and Prof. Perry, and, conse-  
quently, that "broad principles" should al-  
ways govern rather than a consideration of  
what for the time being is best. The paper  
makers of Berkshire, however, act for the  
present, and not on "broad principles." The  
*Republican* states: "All of the paper  
men will go in for keeping up a good stiff  
tariff on paper, not because they cannot  
actually afford to make paper cheaper  
than foreigners, and a superior article, but  
for fear that England will rush her sur-  
plus stock over here, if a reduction is  
made, at prices which will prove ruinous  
to the home trade." "Broad principles"  
would not conform to any such selfish con-  
siderations as these, but would let England  
rush in her surplus stock. This statement  
contains the gist of the reasons why protec-  
tionists are not ready, notwithstanding we  
can manufacture some things as cheap as  
they do in England, to remove our tariff  
and permit free trade in these articles. We  
don't propose that this country shall be made  
a dumping ground for English manufac-  
tures, and our tariff is a notice not to place  
any dirt (taking Lord Palmerston's defini-  
tion) on this lot under penalty of the law.

### Fluctuations in Brazilian Trade.

Brazil is one of the few countries in trop-  
ical America in a tolerably flourishing con-  
dition at the present moment. Most of the  
others are either just emerging from general  
political and financial difficulties or are beset  
with them. Brazil, therefore, deservedly at-  
tracts particular attention. Under date of  
Oct. 4, 1877, we published an article en-  
titled "Our Brazilian Trade;" since then  
we have procured later official trade statistics  
from Rio, enabling us to throw some fur-  
ther light on the commercial relations be-  
tween that country and the rest of the  
world, particularly England. Adding there-  
to the American statistics, we shall be able  
to draw some interesting comparisons and  
conclusions.

The statistics we have examined show  
that the trade movement of Brazil for the  
fiscal years named below has been as fol-  
lows, reducing everything to thousands of  
dollars and including specie:

Import. Export.

1874-75..... 83,775 104,247

1875-76..... 86,075 101,801

The following were the principal articles

exported and the aggregate value of each:

1874-75. 1875-76.

Coffee..... 62,909 57,766

Cotton..... 9,953 5,732

Sugar..... 11,563 7,026

Painguy tea (Mate)..... 744 733

Hides..... 6,388 5,912

Tobacco..... 2,999 3,826

India-rubber..... 5,129 5,057

Diamonds..... 25 25

Other goods, specie..... 4,637 5,401

Total..... 104,247 91,801

We have not the total statistics of Brazil

for 1876-77, but for Rio only, which may be

summarized thus:

Trade Movement of Rio de Janeiro.

From England..... 17,279,595 6,777,785

France..... 8,770,680 5,675,455

Germany..... 3,148,310 4,074,300

Portugal..... 3,426,380 3,073,945

United States..... 3,287,680 2,466,665

Other countries..... 11,062,485 7,442,112

Total..... 46,979,330 30,650,430

The export to the United States has

therefore been nearly eight times as much

as the import, and while 70 per cent. of the

import has been drawn from four countries

in Europe, the United States took nearly

one-half of the entire exports of the port.

In the trade between Brazil and England

a great change has taken place since 1871,

and as England is our greatest competitor in

the empire, it will be useful to investigate

this change.

The export to England has fallen off in

a striking manner, as the following table,

reduced to thousands of dollars, will show:

1872. 1873. 1874. 1875. 1876.

Cotton..... 23,650 14,259 13,759 11,780 7,406

Sugar..... 11,348 10,413 8,711 11,538 6,102

Farina..... 213 92 74 7 7

Cocoa..... 106 103 62 304 219

Coffee..... 2,777 2,995 4,481 4,807 4,057

Nuts and kernels..... 42 128 217 337 155

Farina..... 61 48 75 64 31

Hides..... 2,152 2,622 2,622 2,008 1,487

Horsehair..... 56 43 15 40 34

Drugs..... 55 47 96 130 102

Dyes..... 14 18 15 14 16

Farina..... 96 45 23 20 26

Tobacco..... 28 13 31 36 16

India-rubber..... 4,803 4,746 3,601 5,076 4,699

Wool..... 14 21 8 83 31

Cabinet woods..... 116 269 24 68 121

Bone..... 425 273 205 230 198

Brasswood..... 9 9 5 11 8

Calfskins..... 166 74 30 87 129

Horns..... 26 31 31 30 33

Horns..... 121 329 85 20 79

Other goods..... 900 512 918 605 821

Total..... 47,250 37,000 35,014 37,092 25,893

The greatest decrease, it will be seen, has

been in cotton, some in sugar, hides and

bone, while coffee has increased and India-

rubber has been steady.

The export trade from England to Brazil

has been declining rapidly, particularly in

iron, railroad material, telegraph wire, &c.

The following table shows this fully, the

amounts being in thousands of dollars:

EXPORT FROM GREAT BRITAIN TO BRAZIL.

English-Made goods.

1872. 1873. 1874. 1875. 1876.

Cotton goods..... 17,958 15,259 15,376 17,494 14,998

Arms..... 707 294 441 391 248

Liquors..... 177 171 147 108 116

Coal..... 1,640 2,328 1,983 1,468 1,087

Leather..... 455 392 504 326 370

Hats..... 205 134 116 76 39

Lead and manu-  
factures..... 138 114 98 114 120

Copper..... 331 344 375 287 320

Teleg. material..... 808 820 748 827 664

Drugs..... 198 176 201 174 177

Hardware and cutl-  
ery..... 1,376 1,480 1,365 1,418 1,286

Bar iron, rails, &c..... 3,342 3,383 3,453 2,516 2,435

Telegraph material..... 98 268 417 338 355

Jute fabrics..... 673 571 497 373 325

Woolens..... 2,354 2,345 2,100 2,355 2,223

Linen..... 1,539 1,245 1,040 1,042 839

China..... 531 653 618 444 590

Machinery..... 1,132 1,603 1,270 1,042 1,003

Butter..... 154 377 280 1



which reached the lantern, when at once there was a great flash of flame, which spread from floor to floor and filled the whole building.

#### Two Government Rolling Mills.

The annual report of W. H. Shook, Naval Engineer in Chief, contains the following significant paragraph:

There is in course of gradual construction at the Washington yard a rolling mill of moderate size and its motive engines, for the Mare Island Navy Yard. The very satisfactory results obtained from the use of the one recently built at the Washington yard leave no doubt as to the great saving in the annual outlay for bar iron for naval purposes.

This is a matter which merits the attention of the House Committee on Naval Affairs. Assuming that the gentlemen of our Navy Department have the authority to spend public money in building rolling mills, it is a piece of insane folly to do so, and the result cannot fail to be in a very serious degree detrimental to the public interest. There is no more reason why the government should build rolling mills than there is that it should work ore and coal mines and build blast furnaces. If the engineers of the Navy Department could not get iron of any desired quality and in any desired shape a great deal cheaper and better than they can make it, we should have no fault to find with them for constructing and maintaining rolling mills at Mare's Island and Washington; but if they are laboring under this delusion it is only because they are ignorant of what is going on outside of their own little sphere of alleged usefulness, and so wrapped up in self-conceit that they have no consciousness of the existence of any knowledge greater or more comprehensive than they claim to possess. We do not believe that the government, any more than the individual, should always buy where it can buy the cheapest; but we affirm, without fear of intelligent contradiction, that so long as the government can buy iron both cheaper and better than it can make it, the construction and maintenance of government rolling mills at our navy yards is a shameful misappropriation of public money, as well as one not authorized by law. The country is already so well supplied with rolling mills that all of them now in operation cannot find profitable employment. Many of these mills are under the direction of men who have devoted their lives to the study of every problem connected with the production of wrought iron and its formation into shapes. Any one of these accomplished rolling mill managers knows more about iron and how to roll it than all the engineers of the Navy Department together, and can supply the wants of the government at a price far below that at which the work can be done under the liberal system of divided responsibility which prevails in our navy yards. It is simply impossible for the government to do its own work under any practicable system as well as it can be done by individuals or private corporations, who have given close and intelligent attention to the economies of manufacturing, and have learned during years of experience nearly everything which the navy engineers will have to find out by costly experiment. It is such needless leaks as these which should be stopped in the interest of true economy, and we hope the ironmasters of the country, through the American Iron and Steel Association, will see to it that Congress is fully informed on this subject. The less manufacturing the government does the better for the taxpayers; and if the costly and unnecessary luxury of navy yards was abolished altogether, the government could provide itself with more and better ships than it now has for a good deal less money than it now spends. Government competition with private enterprise is contrary to the spirit of republican institutions, and in the case under consideration contrary to the teachings of common sense.

English ironmasters and political economists seem to be greatly disturbed and incensed at the drift which the government policy is taking in Germany in regard to a reimposition of duties upon iron and steel and goods manufactured therefrom. In accordance with a law passed at the close of the year 1875, the duties on iron were abolished after the 1st of January, 1877, and now, scarcely two years after the operation of the new law, it is to be abandoned. A commission is sitting at Cassel to examine the present condition and future prospects of the German iron and steel trade, and to hear the evidence of delegates sent to the various iron and steel producing countries. There is a strong feeling that the decision of this commission of the Reichstag, which it is thought will shape future measures, will be in favor of protection, especially as Prince Bismarck has been understood to advocate that course. There is certainly no doubt that some branches of German industry must go to the wall unless they receive assistance, notably the manufacture of foundry pig, so that the tender regards of English ironmasters for German consumers of foundry iron in pointing to the increased cost of raw material to them, may be easily understood. German steel manufacturers have been making strong efforts to gain a footing in the export trade, and it is stated that to do this they have sustained losses which they were forced to counterbalance by increased profits at home. Yet the English say they will be able to wage a fiercer war abroad while secure in the possession of the home

market. The question assumes very interesting phases, which we shall watch carefully. As matters look now, there seems to be every prospect of another market being closed upon England, while yet another rival appears to contest her supremacy abroad.

In our summary of the proceedings of the meeting of the American Institute of Mining Engineers at Port Henry, we referred briefly to Dr. Dudley's papers, embodying his researches on the conditions affecting the life of steel rails, with the promise to present abstracts to our readers at an early opportunity. Elsewhere will be found a summary of Dr. Dudley's first and larger contribution, "On the Chemical Composition and Physical Properties of Steel Rails," which we commend to all interested as a lucid exposition of the main features affecting the wearing power of rails. In his estimation of the relative hardening effect of phosphorus, silicon, carbon and manganese, Dr. Dudley has boldly cut the knot. This reduction of the varying amounts of hardness to "phosphorus units" has certainly furnished him with figures which are suggestive, and if borne out by future examinations, will be valuable indicators. Dr. Dudley's conclusions are just and fair, and his recommendations warranted by his researches. We shall look forward with interest to the animated discussion which the paper will receive at the hands of the large number of eminent experts who are expected to speak upon the subject at the next meeting of the Institute.

Some suggestions which merit the careful consideration of the iron trade are thrown out by a correspondent, in connection with the agitation recently revived of restricting the production of iron. This gentleman advocates the establishment of an organization similar to those in all the more important English centers, bearing the character of an exchange. The advantages would be the keeping of accurate and reliable statistical records of production, stocks on hand, &c., and a prompt interchange of opinion between buyers and sellers, resulting in a saving of time, and frequently a saving of money. Whether the present time is favorable for the establishment of such a system we are not prepared to say, but it is probable that the growth of the trade will ultimately lead to it.

The report of the commercial agent of the United States at Aix-la-Chapelle, Germany, printed elsewhere, summarizes the present condition of some important industries of the Rhine Provinces, presenting a very gloomy picture of that busy section of the Empire. It seems from his statements that the German leather industry is now seriously crippled and is in danger of being entirely destroyed by American competition. There is some controversy in regard to the quality of the American article, which German producers assert to be inferior, while consumers continue to support a steadily extending market. We gladly notice such signs of growing intercommunication, which cannot but favorably affect many branches of American industry.

There is a somewhat peculiar state of the market in the West for certain grades of pig iron. No. 3 Bessemer has been the *déte noir*, both of the blast furnaces working on metal for the Bessemer process, and of the Bessemer works themselves. From 15 to 20 per cent. of this grade has been the extreme amount that these works would receive, and even this was not wanted. As the result of the large increase in the number of open-hearth furnaces, however, a demand has sprung up for this grade, and at some furnaces it is commanding a price in excess of that received for No. 1.

#### Restricting the Production of Iron.

PHILADELPHIA, Dec. 6, 1878.

To the Editor of The Iron Age—DEAR SIR: I notice in your issue of December 5 an article entitled, "A Scheme for Restricting the Production of Iron." Through the columns of your valuable paper I should like to make some further suggestions bearing on the subject matter under the above heading, which, in my opinion, will effect a permanent cure of the evil, viz., organize an association to be entitled, "The National American Metal Exchange." In other branches of trade such associations have been found of great advantage to sellers and buyers, and the proposed metal exchange will, I think, prove no exception. The fluctuation in the prices of iron that have occurred of late cannot be wholly attributed to the depression of this particular industry. Those who have given the subject much thought will have come to the conclusion that fewer sensational rumors and more reliable statistics, as well as a closer investigation into the nature of some strange transactions, might have prevented such sudden depreciation in values, and that a more uniform mode of conducting the iron business would tend to give the market greater stability. In the centers of the English iron trade operators have a sound basis to go upon in all their transactions for the present or future delivery. From their metal exchanges reliable statistics are obtained of production, stocks on hand, &c. By the weekly publication of such facts no one can be led astray. The stocks on hand, shipments, output of the furnaces, &c., can be compared every week and with the corresponding week of the preceding year, and operators can realize on their iron in the duldest of times with less sacrifice than here, where the trade, not having any organized source of information, are necessarily more or less in the dark with regard to supply and demand, and constantly subject to the influence of false reports and

rumors manufactured for the express purpose of misleading.

It certainly would be a source of pleasure to commission men and dealers to have their business transacted in a couple of hours instead of the loss of time now incurred, extending a business day's work over from six to ten hours without benefiting the consumer, who may have bought an article of one party at 8 o'clock in the morning for a higher price than it was offered by another two hours later. The consumer could go on 'Change at a certain hour, see what was going on in the trade, hear various opinions, ascertain the basis of prices and purchase on the most favorable terms offered in the room. Yours, respectfully,

JAS. V. UMBERGER.

#### DEATH OF SAMUEL J. REEVES.

President of the American Iron and Steel Association.

The American iron trade sustains a severe loss in the death, on Sunday, Dec. 15, at Phoenixville, Penn., of Samuel J. Reeves, President of the Phoenix Iron Company, and President of the American Iron and Steel Association. Mr. Reeves had been in precarious health for several years, in consequence of long confinement to the details of his extensive business interests, and in consequence also of a distressing domestic affliction—the sudden death, in 1873, of a daughter, while on a pleasure trip to the White Mountains. Frequently during the past two or three years he has been compelled to seek rest and recuperation in trips to the seashore. In the spring of 1877 he visited Florida, and early in the summer of the present year he visited California. All of these recreations were beneficial to his health, but the good effects resulting from them proved to be but temporary. About two months ago he experienced several slight hemorrhages from his lungs, and the gravest apprehensions were at once aroused. He kept his bed constantly until last Sunday, when he was released from suffering, but little hope of his recovery having been entertained by his physicians or friends for several days previously.

Samuel J. Reeves was the son of David Reeves, and was born at Bridgeton, New Jersey, in 1813; he was consequently a little more than 65 years old at the time of his death. He was fitted for college at an academy at Lawrenceville, New Jersey, of which Prof. Van Cleave was the principal, and at the proper time entered the College of New Jersey, at Princeton, from which he graduated about 1840. Soon after graduation he spent a winter in traveling through the South, and in 1842 he visited Europe, where he remained about six months. In 1846 he was married to a Baltimore lady, who survives him and who became the mother of six children—two sons and four daughters. All the children survive their father, except his daughter Maggie, to whose death we have already alluded. She was thrown from a stage on the 11th of August, 1873, and died on the morning of the 12th. She was about 23 years old at the time of her death.

About 1844 Benjamin and David Reeves, brothers, established the Cumberland Nail and Iron Works at Bridgeton, and for many years successfully manufactured nails, with which they largely supplied the Eastern markets. A store was established in Philadelphia for the sale of these nails, and of this store Samuel J. Reeves took charge soon after finishing his collegiate course.

In 1826 the Phoenix Iron Works, at Phoenixville, which had been established by Benjamin Longstreth in 1799, passed into the hands of Reeves, Whitaker & Co., of which firm Benjamin and David Reeves were members. In 1846, after the death of Benjamin Reeves, the firm was reorganized as Reeves, Buck & Co., Robert S. Buck and others becoming partners, and in 1855 its title was again changed to that of the Phoenix Iron Company, which is still retained. The firm of Reeves, Buck & Co. also succeeded in 1846 to the ownership of the works at Bridgeton. At Phoenixville their operations were, however, much more extensive, embracing the manufacture of nails, rails and bar iron in large quantities and also pig iron. The first rails rolled at the Phoenix Iron Works were made on the 16th of November, 1846. About the time of the organization of the firm of Reeves, Buck & Co., David Reeves intrusted to his son Samuel the virtual management of his two iron interests, and he soon became the active manager of both works—at Phoenixville and at Bridgeton. From that day until this—more than thirty years—Samuel J. Reeves has been constantly engaged in the management of extensive iron enterprises. From 1855 to the death of his father in 1871 he was the vice-president of the Phoenix Iron Company, and since then has been its president. He was long the vice-president of the Cumberland Nail and Iron Works, with which works the connection of his family ceased about six years ago. In 1848 the firm of Reeves, Abbott & Co. erected the rolling mill at Safe Harbor, Pa., to roll rails for the Pennsylvania Railroad Company, a blast furnace being also erected at the same time, and of these enterprises Mr. Reeves was the virtual head. Several years ago the business of the Phoenix Iron Company, which had steadily grown with the increased demand for iron rails, was greatly extended by its embarkation in the manufacture of structural iron of all kinds, and of iron bridges for the firm of Clarke, Reeves & Co., and this increase of business added greatly to the cares of Mr. Reeves. He was for many years a director of the Cambria Iron Company, as his father before him had been. He was the inventor, in 1862, of the celebrated Phoenix wrought iron column. The end of a life constantly devoted to hard work is told in his death on Sunday last at an age when, with his constitution and correct habits, he should have been in the very prime and vigor of manhood.

Mr. Reeves took an active interest in the general welfare of the American iron trade. In December, 1849, he participated in the convention of ironmasters held at Philadelphia, and in 1855 he assisted in the organization of the American Iron Association, and in October, 1864, he assisted in the work of revitalizing that organization, which had been permitted to fall into a comatose condi-

tion in 1859. At the meeting in 1864 Capt. E. B. Ward of Detroit was chosen president of the association, and Samuel J. Reeves was chosen first vice-president. The name of the association was changed to the American Iron and Steel Association. Capt. Ward remained its president until the 18th of February, 1869, when he resigned, and Mr. Reeves was elected his successor, and uninterruptedly remained its president from that day to the day of his death, almost ten years. We need not dwell upon the intelligence, promptness, fidelity and courage with which he discharged the always important and often delicate duties of his office, for the members of this association, and all American iron and steel makers, know how well he served them.

Mr. Reeves was a gentleman of culture, easy and graceful, but dignified manners, strict integrity and the loftiest honor. As an ironmaster he understood his business thoroughly; as a citizen he was public spirited; as a political economist he was wise beyond many of his generation, resolutely insisting upon the maintenance of the protective policy as a part of the permanent fiscal system of the country. He could not be intimidated nor cajoled into the support of the Wood Tariff Bill or any other measure of its class. His speeches as president of this association and his occasional arguments before Congressional committees showed that he was eminently a patriotic American citizen, and that he had the courage to stand by his convictions. He was a good man—a just, generous and unselfish man. Our official relations with him, covering six anxious years, have always been of the most pleasant nature. We have lost in him a good friend, and we close this hasty notice of his life and character with a deep sense of personal bereavement.

The remains of Mr. Reeves will be buried in Laurel Hill Cemetery, Philadelphia, to-day.—Bulletin of the Iron and Steel Association, Dec. 18.

#### Funeral of the Late Burton Mallory.

[By Telegraph.]

NEW HAVEN, CONN., Dec. 18, 1878.

The funeral of the late Burton Mallory, senior member of the firm of Mallory, Wheeler & Co., of this city, took place this afternoon at two o'clock, at Mr. Mallory's late residence, 666 Chapel street, and his prominence as a manufacturer and the esteem in which he was held at home were shown by the number and position of those who were in attendance. The officiating clergyman was Rev. Dr. E. E. Beardsley, rector of St. Thomas's Episcopal Church. At least one thousand persons were present, many of them upon the grounds about the house. Representing the trade were J. B. Sargent and H. B. Sargent, of this city and G. H. Sargent, of New York, of Sargent & Co.; C. R. Denckla, of Heaton & Denckla, of Philadelphia; A. G. Angell, of the American Screw Co., of Providence; Henry Russell (2d) and M. J. Woodruff, of Russell & Erwin Mfg. Co., of New Britain and New York; and Thomas Kennedy & Son, of the Branford Lock Works and others. Among those from the city were Mayor Shelton, ex-Mayor H. G. Lewis, ex-Mayor L. W. Sperry, ex-Mayor H. M. Welch, ex-Gov. J. E. English, Hon. Richard S. Follows and John R. Davenport, John S. Davenport and Mrs. T. D. Wheeler, children of the late John A. Davenport, so long associated in business with Mr. Mallory. The employees of the firm, to the number of over 200, attended in a body, and after viewing the remains acted as escort to the cemetery, in charge of E. E. Marsh and Henry E. Talmadge, foremen. They were preceded by the office clerks. The bearers were C. R. Denckla, of Philadelphia; A. G. Angell, of Providence; G. H. Sargent, of New York, and E. E. Hall, W. T. Bradley, Daniel Trowbridge, W. H. Bradley, L. W. Sperry, John E. Bassett, H. G. Lewis, C. S. Leete and F. R. Bliss, of this city. The remains were taken to Evergreen Cemetery for interment. The procession was a very long one, and in it was the empty casket of Mr. Mallory, draped in mourning, escorted by the men servants of the house on foot. In the cemetery the workmen formed a cordon around the grave, encircling the relatives. The floral contributions at the house were very elegant, and included a beautiful offering from the employees. The family received during the day many letters and telegrams of sympathy from representatives of the trade in various sections of the country.

#### Some Severe Comment.

LONDON, Dec. 18.—The Times, in its financial article to-day, says:

The more recent news regarding the state of the West of England and South Wales District Bank has unquestionably done much mischief, and strong complaint was made that the truth was not made more clearly known at the date of suspension.

Instead of telling the worst, as they no doubt could have done, the directors suffered people to nurse the delusion that the suspension was due to a pernicious run, and that therefore the bank might easily be in some form reconstituted. A few knew all along that the whole paid-up capital and reserve were probably lost, but the mass of the people believed the more ideal presentation of affairs.

The result of this concealment has been to renew and intensify the feeling of distrust, which was beginning to die away. Men say, with justice, they can no longer believe what they are told by bankers, and the silliest rumors are endowed with tenfold power for mischief. It is profoundly to be regretted that the credit of the banking community should be played with and shaken in this fashion.

Advices from Stockholm state that another firm, I. Hirsch, has failed with 3,000,000 crowns liabilities, its difficulties having arisen through the fall in the price of iron, and also from unprofitable operations in building and land. The assets are reported to be sufficient, but this is considered doubtful. The firms which have lately failed are believed to have been kept going by banks long after they should have

gone into liquidation. A rather better feeling prevails in Sweden now, but it is feared bank managers there have been no wiser than in other parts of Europe, and hold too many securities and too small proportion of capital.

#### A Canadian View of Free Trade.

The Toronto Mail, in an article on free trade, says:

Let us take a statement by Rogers, the biographer and almost worshiper of Cobden. He writes: "The producer of a protected article debars himself from entering into competition in the foreign markets. To take an example, the United States could take first place in the coal and iron industry of the world; as it is, they have no place at all in those industries." Now, the States supply at home some forty odd millions of people with home-made, home-mined iron and coal; yet, says Rogers, "they have no place at all" in supplying the world; so that, according to this great Cobdenite, 40,000,000 of buyers are of no account in the world's markets. But since Rogers wrote protection has given such a stimulus to the industries in the States that American tools, American iron goods, are being so freely sold in England that a royal commission is being implored to see how it is that a country which has "no place in the world" is taking a place as a competitor in the very center of England's iron industries. Here is no theory, no illustration of supposed conditions. Here is a free-trade authority on one hand and on the other a fact which gives that authority the lie direct. Further, if the States can sell as they now do at Sheffield and Wolverhampton what those vast congeries of workshops manufacture, they can also sell anywhere in the world where those towns now export to, so that besides their own 40,000,000 customers the States have now England herself as a customer, and therefore all England's customers. Yet the very high priest of the free-trade temple says "America has no place in the world's markets." We would like our free traders here, after digesting the above, to ask how could the States ever have established this wonderful iron industry of theirs, which is filling England with alarm, if they had allowed English-made goods to crush, in their inception, all attempts to establish this industry by competition, as they would have done but for protection.

#### Serious Failure of Iron Dealers.

LONDON, December 18.—Zubina & Co., iron ore importers, of Cardiff and Newport, have failed in consequence of the stoppage of the tin plate works of Booker & Co., near Swansea, whose bills Zubina & Co. held to a large amount. This failure will considerably increase the liabilities of the West of England and South Wales District Bank.

#### Another Failure.

LONDON, December 18.—Messrs. Fox, Walker & Co., of the Atlas Engine Works, Bristol, have failed. Liabilities, £60,000.

Glass Items.—A number of the lamp-chimney blowers of Pittsburgh are agitating the subject of leasing the three-pot factory at Mansfield, on the Panhandle road, belonging to Mr. Hope, and operating it on the co-operative plan. At Sharpsburg, Pa., Tibby Bros.' bottle glass house is employing 175 men, 48 of whom are blowers. Both factories are running full.—Operations in the La Salle, Ill., window glass works have been suspended since last May, owing to the ruinous price at which window glass has been selling ever since.—The De Stieger Glass Company, of La Salle, Ill., have an eight 56-inch pot furnace in operation making bottles.—The Buckeye Glass Works, at Martin's Ferry, Ohio, is crowded to its utmost capacity with orders.—The Croton Glass Works, at New Castle, Pa., are running five days in the week, with the prospect of keeping it up all winter.

The Business of One Firm.—As an evidence of the extent of the coal business of Pittsburgh, we give the following figures showing the shipments by the firm of W. H. Brown. Since Nov. 26 ten tons have been sent out as follows:

|                       |           |
|-----------------------|-----------|
| 46 coal boats.....    | 1,058,000 |
| 17 French creeks..... | 453,000   |
| 53 barges.....        | 680,000   |
| 6 fuel barges.....    | 21,000    |

Total.....1,921,000  
In addition to the coal given above there were six barges and three boats, containing 284,000 bushels, making the total shipments 2,205,000 bushels. During the entire month of November, 1877, the aggregate shipments were 1,813,500 bushels of coal, and 315,224 bushels of coke.

A Philadelphia paper states that there has been filed, in the local United States Circuit Court, for W. Romeyn Vermilye, E. M. Cook and others, of New York, a bill in equity directed against the Lehigh Coal and Navigation Company, to restrain that company from entering into an arrangement or agreement to carry into effect a so-called lease of the properties and franchises of the Delaware Division Canal Company of Pennsylvania, or to incur any liability for a guarantee of its bonds, and to enjoin the Lehigh Coal and Navigation Company from further occupying and maintaining a part of that canal, and that they be directed to surrender possession thereof to the Delaware Division Canal Company. The plaintiffs are stockholders of the Lehigh Coal and Navigation Company.

The Nevada Bank recently had an offer of 98½ cents each for its large stock of trade dollars, and refused it because when they were coined it had pledged its word to the government that they should be sold only for exportation. It reckoned its good name more valuable to itself than a profit of six cents apiece on its stock of dollars could be. Some of the parties who have had trade dollars coined under a like promise have had the same self-respect.



## The Cotton and Wheat Crops.

From the returns received this month the Agricultural Department is enabled to make the final estimated computation of the crop of cotton raised this year. The acreage is about 2 per cent. greater than in 1877, an amount not large enough to affect materially the total product, being only 209,503 acres. The October and November returns showed a condition 11 per cent. higher than the same months last year. Owing to the remarkably fine weather for picking, which has lasted to date, the yield of lint per acre is much higher than in 1877, only three States reporting less—Florida, Alabama and Louisiana—while all the others report an increase. The average production for 1878 is 101 pounds per acre, thus making the crop of 1878, in round numbers, 5,197,000 bales of cotton—allowing 450 pounds as the weight of a bale.

The October returns of the Department of Agriculture did not materially change the aspects of the wheat crop as foreshadowed by the monthly reports of condition. The December returns, including estimates of yield per acre, confirm and somewhat enlarge previous estimates. A computation from all the returns show an aggregate crop of about 425,000,000 bushels, but on account of the strongly expressed public anxiety for trustworthy figures, a portion of the inquiries have been referred to the statistical correspondents for revision. It is not believed that the result will be materially different. The increase in the final out turn of the crop is due to the large increase of acreage, which was at least one-sixth greater than the previous year. Many of the larger wheat-producing States very greatly reduced their average yield per acre. Virginia fell from 10.4 bushels to 7.7; Tennessee from 5 to 4; Kentucky from 12.5 to 9.3; Illinois from 16.5 to 13.6; Wisconsin from 15 to 12; Minnesota from 18 to 12; Iowa from 14.5 to 9.4; Missouri from 14 to 11. On the other hand, other States show a marked increase. New York rose from 18 to 19; Pennsylvania from 13 to 15; Ohio from 15 to 18; Michigan from 17.5 to 18.3; Indiana from 14.5 to 15.8; Kansas from 13.5 to 16.3; California from 9.5 to 14.4. The Territories show an immense expanse of wheat cultivation, with the high average yields characteristic of virgin soils. The yield of some of the Territories was considerably more than double that of the previous crop.

**The Glass Makers' Strike.**—The trouble in the glass works at Pittsburgh still continues. The workmen have defined their position as follows: The proposition of the manufacturers that the work shall be done by the 100 instead of by the turn, is acceptable to all excepting the gatherers. In their case it is unjust, because they have not control of their time, but must work or stop according to the pleasure of the presser. As to working five hours for a turn, the men are willing to accede to the proposition in case of failure on their part to make the required number of pieces in less time. The manufacturers are accorded the right to make such articles as the trade demands, to hire such persons as they may deem proper, and to discharge any employee for neglecting his work, for making bad work, for wilfully injuring property, or for conduct detrimental to the interests of the manufacturer. In answer to this the manufacturers say they will stand by their ultimatum, and will refuse to consider any proposition for a compromise with the pressers as a union. They are willing to confer with the men outside of their union—that is to say, the proprietors of the several factories will meet their employees, each firm acting for itself alone, and requiring that the men of each factory shall act without reference to the pressers outside of the establishment in which they are employed. As to the assertion that it is unjust to require the gatherers to work by the 100 instead of by the turn, the manufacturers say that the gatherer is no more under control of the presser than is the finisher, and he is not therefore entitled to special privileges. In short, the several firms express their determination to no longer submit to the dictation of their employees, and to conduct their own business in their own way.

A large crowd assembled on the viaduct at Cleveland on the 3d inst. to witness the first swing of the massive iron drawbridge that connects the east and west sides of the city over the Cuyahoga River. Fifteen men swung the draw in 11 minutes. Everything worked smoothly, all measurements being exact. The total weight of the bridge and table is 625 tons. The formal opening of the viaduct will probably take place on December 27.

## Special Notices.

## Bookkeeper or Salesman.

A young man, age 26, for five years with one house, desires a position as bookkeeper or salesman. Is competent to take entire charge of books. Has had experience on the road. References unquestionable. Address **N. A. W.**, Office of The Iron Age, 83 Reade St., New York.

## TO IRON, STEEL OR HARDWARE MANUFACTURERS.

The undersigned, having been thrown out of employment by the failure of the firm he has been connected with for several years, solicits the correspondence of any house in above line needing the services of a trustworthy man. Is a thorough bookkeeper and familiar with all details of office work. Has also been on the road.

Address **HENRY CLIFFORD**, Office of The Iron Age, 83 Reade St., N. Y.

**SITUATION WANTED** as Traveling Salesman. Eleven years' experience in the hardware business. Have traveled five years for a manufacturing house in New York city. Good city and state trade. Have also traveled in Western States. Good reference and satisfactory reason for leaving present employers.

Address **COMMERCIAL TRAVELER**, Office of The Iron Age, 83 Reade St., New York.

**WANTED**—BY A YOUNG MAN, a position as salesman on commission, for a manufacturer of some line of hardware or tinware, in this city and the neighboring towns. Has an established trade.

Office of The Iron Age, 83 Reade St., N. Y.

## Special Notices.

## Leigh's Tables of Mercantile Discounts

(5% to 8½% and all the combinations.) Arranged in three parts:  
I. Comparative Discounts.  
II. Comparative Net Prices.  
III. Computing Tables.

Parts I and II specially adapted to the use of Buyers and Salesmen. Part III for all who have to figure discounts.  
**Reliable, Comprehensive, Practical.**  
Mailed postpaid to any address for \$1. Address **EDWARD B. LEIGH**, St. Louis Elevator, St. Louis, Mo.

Or either of the Publishers, viz: **IVISON, BLAKEMAN, TAYLOR & CO.**, New York. R. & T. A. ENNIS, St. Louis.

## SECOND-HAND MACHINIST TOOLS.

30 in. x 12 ft. Engine Lathe; do. 24 in. x 24 ft. Pond, nearly new; 22 in. x 10 ft. good order; 18 in. x 8 ft. Star Tool Co. new; 16 in. x 10 ft. Anne Ring. Co. nearly new; 16 in. x 5 ft. Stroud, fair order; 15 in. x 4 ft. Pittsburgh Mach. Co.; 14 in. x 5 ft. Flathead; 13 in. x 4 ft. Pratt & Whitney, with taper attachment; 3 Spencer Hand Lathes; one 12 in. x 4 ft. Hand Lathe; 1 square arbor Fox Lathe; one 38 in. x 7 ft. Planer; 1 do. 30 in. x 7 ft.; 1 do. 27 in. x 7 ft.; 1 do. 24 in. x 5 ft.; 1 Crank Planer; 12 in. stroke; 1 do. 24 in. stroke; 2 Profile Machines; one 10 in. Fitchburg Shaper; 1 N. Y. S. E. Co. 9 in. new; two 24 in. Hendy, new; one 14 in. Hendy, new; 1 Mason Milling Machine, heavy; 2 No. 8 Brainard; 1 Lincoln Pattern Milling Machine; 2, 3 and 4 spindle P. & W. Drills; No. 2 and 6 Wilder Punch Press; one Schlenker No. 2 Bolt Cutter, new; 1 Sellers Bolt Cutter; 1 No. 3 Smith & Garvin Miller, new; 2 Hand Mills, new; 1 Screw Machine; 2000 in. Corliss; 12 in. Green; 12 in. Whitehill; 12 in. in. new, Harris Corliss; 1024 in. Fishkill Landing; one 45 h. p. Hor. Tub. Boiler; one 25 h. p. Vert. Tub. Boiler, with Pump and Heater, new; 12 "Sensitive" Drills for fine drilling.

E. P. BULLARD, 14 Dey St., New York.

## SPECIALTIES.

## STEAM PUMPS and STEAM MACHINERY.

Steam Pumps for every possible duty. Estimates given for and Pumps erected in artesian and other wells any depth or capacity. Special Pumps to work with exhaust steam, guaranteed to put no back pressure on the engine. All machines fully guaranteed.

**GEO. W. STORER**, 133 North 3d St., Philadelphia, Pa.

## To Capitalists and Manufacturers.

## FOR SALE IN CANADA.

Complete manufacturing establishment for making Bolts, Nuts and Spikes. Extensive premises, conveniently situated, containing all requisite tools, plant, machinery, furnaces, shafting, belting, pulleys, taps, dies, &c., all complete, in working order. Good and increasing market. No manufactory at present in Canada. Protective tariff of 17½ per cent. ad valorem, and every prospect of its being largely increased. Will be sold at a bargain. Terms liberal. For particulars apply to

**J. H. BARTLETT**, 64 King St., E., Toronto, Canada.

## PARTNER WANTED.

Wanted, in a flourishing city in Missouri, a partner with \$20,000, either in cash or its equivalent in hardware, in a well-established and successful Hardware house. To a Hardware Merchant who would like to move his stock West this opportunity presents unusual advantages, as the only reason for this advertisement is that more business is available than the owner has capital to take care of. Address **P. A. T. N. E.**, Office of The Iron Age, 83 Reade St., N. Y.

## SPECIAL NOTICE.

**CHEAP HARDWARE.** Having determined to close out our entire stock of Hardware, as we intend quitting business, we are offering special inducements regardless of cost. Call and see **LANE & BOONE**, Importers and Jobbers of Hardware, 1227 Market St., Philadelphia.

## Hardware Business

## For Sale,

in one of the best situations in Philadelphia, Pa.

Address **E. J.**, Office of The Iron Age, 83 Reade St., N. Y.

## FOR SALE LEASE OR EXCHANGE.

Valuable Factory with Established Trade, Agricultural Implements or would Wood Iron and Steel. Smithy, Foundry, Wood and Machine Shops, Dry House, etc., all new. In city of 25,000 population, center best agricultural part Illinois. Gas and water, five railroads, two switches at door, cheap coal. Cost \$100,000. One-third that amount will buy. Address **Care of N. W. AYER & SON**, Philadelphia, Pa.

## WANTED.—BY A MAN OF EIGHTEEN

years' experience in the Hardware business, who has been on the road, a situation as traveling salesman for a Hardware or Cutlery manufacturer or jobbing house. Best of references given. Salary not so much an object as permanent employment. Address **M. J.**, Care of Box 1220, Richmond, Ind.

## Wanted,

Position as Superintendent of Rolling Mill, by party educated as an engineer, but engaged for past nine years in practical rolling-mill work. Possesses knowledge of chemical analysis necessary for the economical admixture of stock. Refers by permission to former employers.

Address **A. J. MOXHAM**, Louisville Rolling Mill Co., Louisville, Ky.

## RUSSIA.

Advertiser, experienced in Machinery, especially agricultural, with a very large connection, seeks to REPRESENT A GOOD AMERICAN FIRM. Address **JOHN E. GRAVES**, Berdiansk, S. Russia.

## A MAN OF LONG EXPERIENCE WITH ONE

of the largest and best known houses in this city, desires situation January 1st. Thoroughly conversant with Locks, Bronze and Builders' Hardware. Competent bookkeeper. Salary moderate. No objection to leave city.

Address **HOWARD**, Office of The Iron Age, 83 Reade St., New York.

## THE UNDERSIGNED, FOR THE PAST TEN

years business manager and bookkeeper at Coleman Eagle Bolt Works, Philadelphia (now about leaving for reasons which will be satisfactorily explained), desires a position in any capacity where his experience and extensive acquaintance with the iron and hardware trade would be of advantage to his employer. S. TALBOT, Office of The Iron Age, 220 S. 4th St., Phila., Pa.

## Special Notices.

## JENNINGS'S COMBINATION DISCOUNT TABLES.

(Published by the author.)  
(2½ to 85% and all the combinations.)

The Discount or Net on any amount of dollars and cents, from a penny to one million dollars, can be ascertained in a few seconds entirely by Addition. Just the thing for making or proving invoices, finding Net Value of goods bought or sold, and comparing different Discounts, thereby saving time, blunders and Headwork. Shows at a glance either the Discount or Net of \$1.00, with any combination.

Contains Computing Tables for nearly five times as many combinations as any other work published. Is arranged so that the eye has no horizontal lines or columns to follow. The number of Dollars or Cents and the Discount or Net of the same are seen at one glance. No Decimal Points to be changed in the mind.

READ! READ! READ!

The first edition of 1000 copies cost nearly \$2.00 per volume, without allowing anything for the labors of the Author. Having electrotype plates of each page, the expense of second edition is much less.

For the purpose of more quickly introducing the work, the publisher proposes, until further notice, to send a copy (Counting-House Edition, price, \$3.00), postpaid, to any address on receipt of

## ONE DOLLAR.

In due time the price will be advanced so as to afford a moderate profit. Merchants, Manufacturers, Bookkeepers and Clerks now is your time. Send in your Dollar and receive the book by return mail.

This book has a copious

## INDEX.

which is more for convenience than necessity, and would not be referred to one time in twenty. The arrangement of the 1500 tables is such that any combination can be found without the Index as easily and quickly as in a rival work containing 300 tables, and the variety of combinations is so great that the annoyance and delay caused by looking for combinations that are not there is prevented.

Currency may be sent by mail at publisher's risk. Address

**S. H. JENNINGS**, Deep River, Conn.

## Foreign Houses

Importing American Goods, and desiring the services of a reliable Agent at a moderate commission to attend to all their business in the United States, are invited to correspond (in English) with the undersigned.

Has had three years' experience as purchasing agent for Messrs. Wm. Marples & Sons, Sheffield and London, England.

Address **S. H. JENNINGS**, Deep River, Conn., U. S. A.

## Valuable Mill Property

## AT PUBLIC SALE,

On the Premises, New Brighton, Beaver Co., Pa., on Thursday, January 18th, at 2 p. m. Known as the KEYSTONE WOOLLEN MILLS, Consisting of

One four-story Brick and Stone Building, 83x33, with two-story Stone Attachment; lot 150x150.  
One four-story Brick and Stone Building, 66x36, with two-story Stone Attachment, 32x36 and 66x36.  
One four-story Brick Warehouse, 48x27, with small Dwelling and Stable, lot of both being 100x20. A 30-ft. street runs through both these properties. Also one-third interest in a three-story Carpenter Shop, lot 60x100 feet.

Ample water-power to each of the mills, which contain four sets of cards, with looms, etc., all in good running order. The property will be divided and sold with or without the machinery. For full description apply to

**MILTON TOWNSEND**, New Brighton.  
**RICHARD CADBURY**, 225 Chestnut St., Phila.  
**H. P. BANCROFT**, 98 Franklin St., New York.

New Brighton is on the Beaver River, 57 miles from Pittsburgh, on the P. Ft. W. & C. and P. & E. R. R., and is the center of a population of about 15,000.

## To Steel Manufacturers.

An energetic young man with scientific training, who has had experience in the manufacture of Bessemer and Crucible Steel, in preference to remaining unemployed would be willing to take a subordinate position with the prospect of being employed as blower in Bessemer or as melter in Siemens-Martin steel works. Highest recommendation as to integrity, character and ability furnished. A correspondence, which shall be strictly confidential, respectfully solicited.

Address **A. I. W.**, 33 West 35th St., New York.

## Bissell &amp; Welles,

## Wholesale Hardware Auctioneers,

83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and Importers.

## FOR SALE,

Job Lots and Bankrupt Stocks Hardware.

Great bargains offered to the trade.

Address **A. W. WHEELER**, 141 Lake St., Chicago, Ill.

## DISSOLUTION OF PARTNERSHIP.—Notice is

hereby given that the Partnership heretofore existing between CARL STEINMAN and JAMES EDWARD DENISON, under the name and style of the "American Hardware Company," has been this day DISSOLVED; and all parties indebted to the said company are hereby notified that receipts for payment must bear the signature of the undersigned, otherwise they will not be recognized.

JAMES E. DENISON, 9 William St., Melbourne, 25th August, 1878.

## INTERNATIONAL EXHIBITION,

## MELBOURNE, AUSTRALIA.

American manufacturers and others who wish to be represented at the International Exhibition, to be held in Melbourne in 1880, are respectfully requested to communicate with the undersigned, who is now making arrangements for personally attending to a limited number of exhibits. Terms, references and full particulars can be obtained on application to

**JAMES E. DENISON**, 9 William St., Melbourne, Australia.

## Special Notices.

## Special Announcement

## SECOND-HAND AND NEW TOOLS

## FOR SALE.

The Tools in the following list are all of Wood, Lighte & Co.'s make, have been used, but are all in good order and will be sold low:

Five Engine Lathes, 13 in. swing 6 ft. bed.  
Six Engine Lathes, 20 in. swing 7½ ft. bed.  
Five Engine Lathes, 20 in. swing 8 ft. bed.  
One Engine Lathe, 21 in. swing 6 ft. bed.  
One Engine Lathe, 21 in. swing 16 ft. bed.  
One Engine Lathe, 24 in. swing 12 ft. bed.  
One Engine Lathe, 26 in. swing 12 ft. bed.  
Two Upright Drills, 27 in. swing, not geared.  
One Upright Drill, 22 in. swing, not geared.  
One Upright Drill, 32 in. swing, back geared and self feed.  
One Planer, 24 in. x 23 in. x 4 ft.  
One Planer, 24 in. x 24 in. x 4 ft.  
Two Planers, 30 in. x 30 in. x 8 ft.  
One Planer, 32 in. x 30 in. x 10 ft.  
One Planer, 37 in. x 37 in. x 10 ft.  
One Planer, 42 in. x 36 in. x 15 ft.  
One Planer, 72 in. x 66 in. x 24 ft.  
One Shaping Machine, 12 in. stroke.  
Four Bolt Cutters, various sizes.  
Two No. 3 Milling Machines.  
One Horizontal Boring Lathe.

The following are all new tools to be sold very low, and are all Wood, Lighte & Co.'s make:

One Engine Lathe, 13 in. swing, 4 ft. bed.  
Two Engine Lathes, 13 in. swing, 5 ft. bed.  
One Engine Lathe, 13 in. swing, 6 ft. bed.  
Four Engine Lathes, 16 in. swing, 6 ft. bed.  
Two Engine Lathes, 16 in. swing, 8 ft. bed.  
One Engine Lathe, 20 in. swing, 20 ft. bed.  
One Engine Lathe, 28 in. swing, 14 ft. bed.  
Three Planers, 24 in. x 24 in. x 4 ft.  
Two Planers, 24 in. x 24 in. x 6 ft.  
Two Upright Drills, 32 in. swing, back geared and self feed.  
One Planer, 36 in. x 36 in. x 12 ft.  
Two Shaping Machines 11 in. stroke.  
Three Shaping Machines, 11 in. stroke.  
One Shaping Machine, 14 in. stroke.  
One combined Shaping and Slotting Machine.  
Two No. 1 Bolt Cutters.  
Seven No. 2 Bolt Cutters.  
One No. 3 Bolt Cutter.  
One No. 1 Bolt Cutter, with centers.  
Five No. 2 Bolt Cutters, with center.  
One No. 1 Milling Machine.

For sale by the

**GEO. PLACE MACHINERY AGENCY**,

121 Chambers and 103 Reade Sts.

## DECEMBER LIST, No. 2.

## MACHINE TOOLS,

## Second-Hand.

One Portable Engine, 6 in. cylinder.  
One No. 3 Stiles Geared Press.  
One No. 3 Fowler Press.  
One Hand Milling Machine.  
One "Pond" Index Milling Machine.  
Three Chase Patent Pipe Cutting Machines.  
One Engine Lathe, 16 in. swing, 8 ft. bed.  
One Back Geared and Self-Feed Drill, 32 in. swing.

Two Engine Lathes, 21 in. swing, 6 ft. bed.  
Two Engine Lathes, 21 in. swing, 8 ft. bed.  
One Engine Lathe, 13 in. swing, 6 ft. bed.  
One Engine Lathe, 15 in. swing, 7 ft. bed.  
Three Engine Lathes, 20 in. swing, 8 ft. bed.  
Six Turning Lathes, 14 in. swing, 4½ ft. bed.  
Three 4-spindle Drills.  
One 8 in. Shaper.  
One Gear Cutter.  
"Hardway" Bolt Heading Machine, to head up to 7½ in. bolts. One new "Hardway" Bolt Heading Machine to head up to 1½ in. bolts. A lot of Saw Tables and Wood Working Machinery.

Please specify which of the above tools you want and we will forward all particulars. The above tools will be sold very low, and can be seen at

**The Geo. Place Machinery Agency**,

121 Chambers and 103 Reade Sts.,

NEW YORK.

## One 9-inch Train Rolls,

## One 16-inch Train Rolls,

## Both with Housings.

## Two Steam Hammers,

## One Pair Shears,

## One Lot Steel Ingot Moulds,

## Three Large Woodward Steam

## Pumps,

## Three Small Steam Pumps,

## Two Hoisting Engines,

## Three Steam Boilers,

## One Light Gas Condenser,

## One Surface Condenser,

## Deck Pumps, Low Pressure Gauges,

## Registering Gauges, &amp;c.,

FOR SALE LOW BY

**DANIEL W. RICHARDS & CO.**,

Dealers in

## Scrap Iron &amp; Metals,

88 to 96 Mangin St., New York.

## For Sale,

A 200-LB. BRADLEY HAMMER,

but little used, good as new. Price, at factory,

\$700.

ONE 30-TON CRANE,

"no better in the State," as good as new. Price,

\$400 at factory.

**WM. D. PARDEE**,

NEW HAVEN, CONN.

## Special Notice.

The undersigned offer their services as Agents to makers of American Cabinet Hardware. They keep a full line of UPHOLSTERERS' AND CABINET MAKERS' MATERIALS.

**LOUIS WINDMULLER & ROELKER**, 20 Reade St., New York.

Address in FRANKFURT-ON-MAIN, GERMANY, **ERWIN ROELKER**.

**WANTED**.—A German, at present engineer at one

huetta, Giechhofungshuetta, Oberhausen, seeks an

engagement in this country. He has a thorough prac-

tical and theoretical experience in the management

of blast furnaces, foundries and coke works, and has

acquired a thorough knowledge of metallurgical

chemistry, being a graduate of the Royal Academy of

Berlin. He wishes specially to form an engagement

with an establishment where his invention of a new

process of eliminating phosphorus from iron and

steel, recently patented in this country, would be put

to a practical test. Address **P. A. BERG**, P. O. Box 439, New York.

## Special Notices.

## Second-Hand Machinery

## For Sale Low.

## SEND FOR LIST.

Engine Lathe, built by Seth Wilmarth, 82 in. swing, 21 ft. bed, live spindle hollow, face plate both ends, one at front 6 ft. 4 in. diameter, one at rear 7 ft. ¼ in. diameter, two boring bars traversed by tail spindle, both arranged for splining key ways; one of these bars is designed for work on rear face plate and has yoke to support outer end; on either face plate work may be bored, turned and splined without removing the fastenings. At rear face plate an adjustable bed 12 feet long, carrying an adjustable foot rest, the latter having 3 ft. 6 in. traverse, arranged to sit at any angle and in any position on above bed. Tail spindle is ¼ in. square, carriage is fed by a screw the full length of bed, cross feed automatic, 6 grades of feed to operate either, 10 grades of speed for live spindle, driving movement gears direct to front face plate, complete with counter-shaft for driving, splining and feeding. One large saddle or center rest.

Planer, built by W. Collier & Co., Salford, Eng., planes 24 in. wide, 48 in. high, 18 ft. long, automatic cross, vertical and angular feed, platen driven by gearing into step rack, return motion about 3 to 1; has third upright with vertical tool slider, automatic feed, to plane work that will not pass between the regular uprights. This slider has a vertical movement of 5 ft. 4 in. Counter-shaft.







first law of nature," and applied the words to his own company's policy, are generally considered as foreshadowing a lively struggle for a market. Few expressions of opinion have been obtained from other prominent men in the Coal trade, but the general drift of conversation seems to be toward a fight. Prices are, of course demoralized, though we did hear of one firm which decided upon quotations yesterday, and printed a circular last evening for distribution to-day. Below we give full particulars of the sale. Mr. F. E. Seward kindly furnishes us with the averages, which are made up by quantity and price, and on account, although differing very materially from some of the averages published.

The following are the prices obtained at the 16th Scranton auction sale, which took place yesterday (18th) noon, 100,000 tons sold:

| Size.         | Tons.  | Highest. | Lowest. | Average. |
|---------------|--------|----------|---------|----------|
| Steamer.....  | 5,000  | \$2.47   | \$2.37  | \$2.44   |
| Grate.....    | 80,000 | 2.55     | 2.30    | 2.55     |
| Egg.....      | 30,000 | 2.70     | 2.67    | 2.67     |
| Stove.....    | 40,000 | 3.00     | 2.90    | 2.95     |
| Chestnut..... | 15,000 | 2.45     | 2.30    | 2.45     |

Below we give Mr. Seward's table of the auction sales for the past year, including the average of the present sale:

| AUCTION SALES, 1878. |        |        |        |        |        |
|----------------------|--------|--------|--------|--------|--------|
|                      | Stmr.  | Grate. | Egg.   | Stove. | Ch't.  |
| Jan. 30.....         | \$2.10 | \$2.12 | \$2.15 | \$2.17 | \$2.11 |
| Feb. 27.....         | 2.15   | 2.07   | 2.15   | 2.15   | 2.00   |
| March 27.....        | 2.25   | 2.21   | 2.40   | 2.60   | 2.18   |
| May 1.....           | 3.35   | 3.30   | 3.45   | 3.70   | 3.15   |
| May 29.....          | 3.45   | 3.45   | 3.50   | 3.75   | 3.25   |
| June 26.....         | 3.47   | 3.49   | 3.50   | 3.75   | 3.25   |
| July 31.....         | 3.47   | 3.47   | 3.50   | 3.75   | 3.25   |
| Aug. 28.....         | 3.52   | 3.52   | 3.60   | 3.80   | 3.25   |
| Sept. 25.....        | 3.56   | 3.56   | 3.68   | 4.07   | 3.25   |
| Oct. 30.....         | 3.45   | 3.57   | 3.67   | 4.05   | 3.31   |
| Nov. 26.....         | 3.80   | 3.81   | 3.83   | 3.75   | 3.07   |
| Dec. 18.....         | 2.44   | 2.55   | 2.67   | 2.98   | 2.42   |

It will be noticed from this table that the average decline from the November sale is no less than 70 cents.

This state of affairs in the Anthracite trade is having a very depressing effect upon Bituminous Coals, although it is too early to say just what the result will be.

### OLD METALS, PAPER STOCK, &c.

We have no perceptible change to report in the condition of the market for Old Metals, Rags, Paper Stock and other junk materials during the period that has elapsed since the date of our last. Trade continues very dull, and prices are nominally unchanged.

The purchasing prices offered by dealers for Old Metals are as follows:

|                         |                |       |       |
|-------------------------|----------------|-------|-------|
| Copper, heavy.....      | per lb. \$0.1  | @     | ....  |
| Copper Bottoms.....     | .....          | ..... | ..... |
| Yellow Metal.....       | .....          | ..... | ..... |
| Brass, heavy.....       | .....          | ..... | ..... |
| Brass, light.....       | .....          | ..... | ..... |
| Composition, heavy..... | .....          | ..... | ..... |
| Lead, solid.....        | .....          | ..... | ..... |
| Tea Lead.....           | .....          | ..... | ..... |
| Zinc.....               | .....          | ..... | ..... |
| Pewter, No. 1.....      | .....          | ..... | ..... |
| Pewter, No. 2.....      | .....          | ..... | ..... |
| Wrought Iron.....       | prton. \$16.00 | ..... | ..... |
| Light Iron.....         | .....          | ..... | ..... |
| Stove Plate.....        | .....          | ..... | ..... |
| Machinery do.....       | .....          | ..... | ..... |
| Grate Bars.....         | .....          | ..... | ..... |

The prices current for Rags, &c., are as follows:

|                             |              |        |       |
|-----------------------------|--------------|--------|-------|
| Canvas, Linen.....          | per lb. 3 c. | @ 3/10 | ..... |
| " Cotton.....               | .....        | .....  | ..... |
| " No. 1.....                | .....        | .....  | ..... |
| White, No. 1.....           | .....        | .....  | ..... |
| " No. 2.....                | .....        | .....  | ..... |
| Seconds.....                | .....        | .....  | ..... |
| Mixed, Woolen.....          | .....        | .....  | ..... |
| Soft.....                   | .....        | .....  | ..... |
| Gunny bagging.....          | .....        | .....  | ..... |
| Jute butts.....             | .....        | .....  | ..... |
| Kentucky bagging.....       | .....        | .....  | ..... |
| Book Stock.....             | .....        | .....  | ..... |
| Newspaper Stock.....        | .....        | .....  | ..... |
| Waste Paper and Scraps..... | .....        | .....  | ..... |
| Kentucky Bale Rope.....     | .....        | .....  | ..... |
| Tarred Shaking.....         | .....        | .....  | ..... |
| Grass Rope.....             | .....        | .....  | ..... |

### IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Dec. 16, 1878:

| Hardware.  |  | Lang W. Bailey & Co.                                     |  |
|--|--|--|--|
| Armstrong M. & Sons, Casks, 1                        |  | Naylor & Co., Pig, tons, 400                             |  |
| Baker Hermann & Co., Hardware and cutlery, pkgs., 55 |  | Perkins, Livingston & Co., Cast, cs., 750; lbs., 100,000 |  |
| Burkshaw W. C., Packages, 3                          |  | Seligman J. & W., Pig, tons, 40                          |  |
| Bruce & Cook, Wire, bbls., 20                        |  | Order, Packages, 2                                       |  |
| Brown William, Grindstones, 50                       |  | Spiegel, tons, 251                                       |  |
| Folsom H. & D., Arms, cs., 3                         |  | Pig, tons, 60  |  |
| Friedmann & Lauterjung, Mide, pkgs., 4               |  | Sheet, bxs., 82  |  |
| Fraser P. A. & Co., Casks, 2                         |  | Steel.   |  |
| Henderson Bros., Guns, cs., 1                        |  | Naylor & Co., Casks, 9                                   |  |
| Hayden Peter, Casks, 5                               |  | Sanderson Geo. & Co., Bundles, 36                        |  |
| Livingstone W. & F., Grindstones, cs., 23            |  | Woodford W. O., Bundles, 24                              |  |
| Milliken & Smith, Wire, bundles, 82                  |  | Wolfe R. H. & Co., Bundles, 84                           |  |
| Moss, Hosslein & Co., Cases, 2                       |  | Order, Bundles, 3  |  |
| Noyes, Smith & Co., Gun caps, cs., 2                 |  | Byrne Jos. & Co., Tin plates, bxs., 2185                 |  |
| Remington E. & Sons, Gun barrels, cs., 2             |  | Bruce & Cook, Tin, cs., 1                                |  |
| Robbins Chauncy & Son, Cutlery, cs., 1               |  | Cort N. J., Tin andterne plates, bxs., 1232              |  |
| Rogers Henry & Co., Cases, 1                         |  | Cort N. J., Tin andterne plates, bxs., 1232              |  |
| Rauft & Rich, Wire, cs., 1                           |  | Lamarche H., Zinc, rolled, ca., 9; cks., 10              |  |
| Schuyler, Hartley & Graham, Pistols, cs., 1          |  | Naylor & Co., Tin plates, bxs., 5814                     |  |
| Smith T. E. & Co., Millstones, 2                     |  | Phelps, Dodge & Co., Tin plates, 102                     |  |
| Thompson C. L., Wire rope, cks., 8                   |  | Black taggers, 41  |  |
| Walsham J., Cases, 5                                 |  | Tin, slabs, 27   |  |
| Witte J. G. & Bro., Cases, 1                         |  | Tin sheets, bxs., 1                                      |  |
| Winchester Arms Co., Mide, pkgs., 2                  |  | Tin andterne plates, bxs., 1506                          |  |
| Wiebusch & Hilger Hdw. Co., Cutlery, pkgs., 33       |  | Without Bill of Lading, Tin, slabs, 219                  |  |
| Order, Anvils, 86                                    |  | Tin, ingots, 130   |  |
| Arms, cs., 3   |  | Tin, ingots, bbls., 5                                    |  |
| Wire, bbls., 698                                     |  | Tin pl'ts, bxs., 15,679                                  |  |
| Piles, cks., 20                                      |  | Black tag's, bxs., 125                                   |  |
| Packages, 10   |  | Zinc plates, 107   |  |
| Chains, kegs, 1                                      |  | Tin sheets, bxs., 1                                      |  |
| Wire, cks., 1  |  | Tin andterne plates, bxs., 1506                          |  |
| Iron.  |  |  |  |
| Brown Bros. & Co., Rills, coils, 248                 |  |  |  |
| Ivan H. & Co., Pig, tons, 200                        |  |  |  |

### EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Dec. 17, 1878:

| Hamburg.   |         | Canary Islands.            |        |
|--|---------|----------------------------|--------|
| Spelter, alabs, 1303   | \$3.103 | Ag. imp, pkgs, 2           | 51     |
| Hdw., cs., 232   | \$3.103 | New Zealand.               |        |
| Brass g'ds, cs., 10  | 382     | Hdw., cs., 512             | 12,109 |
| Mf. iron, pkgs, 1  | 85      | Tackles, cs., 15           | 61     |
| C'ge mlt, pgs, 16  | 970     | Pumps, pkgs, 10            | 578    |
| Mach'y, pgs, 36  | 4,358   | Mf. iron, pkgs, 124        | 1,731  |
| Pt'd ware, cs., 8  | 83      | Pistols, cs., 1            | 140    |
| Pumps, pkgs., 15   | 491     | C'ge mlt, pgs, 39          | 1,228  |
| Rotterdam.   |         | Ag. imp, pkgs, 10          | 867    |
| Hdw., cs., 56  | 1,037   | Lea, belt, cs., 3          | 608    |
| Ag. imp, pkgs, 11  | 435     | Nails, pkgs., 36           | 608    |
| Pumps, pkgs., 15   | 900     | Pt'd ware, cs., 48         | 3,774  |
| Wringers, cs., 32  | 1,300   | Wagons.....                | 2      |
| Burners, cs., 1  | 150     | French West Indies.        |        |
| Dublin.  |         | Carriages.....             | 1,250  |
| Ag. imp, pkgs, 363   | 4,575   | C'ge mlt, pgs, 8           | 144    |
| Bremen.  |         | Haere.                     |        |
| Hdw., pkgs., 53  | 887     | Spelter, alabs, 550        | 1,570  |
| Ag. imp, pkgs, 5   | 130     | Mach'y, cs., 15            | 3,450  |
| Belling, cs., 1  | 370     | Carriages, bxs, 8          | 400    |
| Belting, cs., 1  | 370     | Hdw., cs., 7               | 416    |
| Danish West Indies.  |         | Ag. imp, pkgs, 72          | 4,175  |
| Carbines, box, 1   | 62      | Copper, cks., 83           | 30,000 |
| Hdw., pkgs., 53  | 376     | Pt'd ware, cs, 3           | 140    |
| Antwerp.   |         | United States of Colombia. |        |
| Mach'y, pkgs, 7  | 700     | Revolvers, cs, 17          | 3,078  |
| Car wheels.....  | 30      | Cartridges, cs, 9          | 316    |
| Valves, pkgs., 16  | 300     | Mf. iron, pkgs, 114        | 1,037  |
| Hdw., pkgs., 24  | 398     | Pt'd ware, cs, 663         |        |
| Glasgow.   |         | Mach'y, cs., 65            | 927    |
| Hdw., pkgs., 47  | 1,665   | Needles, cs, 3             | 87     |
| Pumps, pkgs., 1  | 90      | Gas fixt., bxs, 15         | 1,030  |
| Belling, cs., 1  | 370     | Nails, pkgs., 36           | 608    |
| Mach'y, pkgs, 14   | 1,750   | Sh't lead, roll, 1         | 124    |
| Car wheels.....  | 301     | Wire cloth, cs, 1          | 138    |
| British North American Colonies.   |         | Ag. imp, pkgs, 8           | 109    |
| Coal, tons.....  | 531     | Hdw., cs., 850             | 4,577  |
| Car wheels.....  | 24      | Tinware, cs., 2            | 85     |
| Liverpool.   |         | Guns, cs., 8               | 772    |
| Ag. imp, pkgs, 1   | 875     | Tacks, cs., 27             | 250    |
| Pistols, bxs, 12   | 2,500   | Pumps, cs., 14             | 1,430  |
| Pt'd ware, cs., 9  | 970     | Cutlery, cs., 150          | 3,797  |
| Mach'y, pkgs, 115  | 2,744   | Copper, cs., 2350          | 971    |
| Pumps, pkgs, 13  | 861     | Belting, cs., 3            | 161    |
| British West Indies.   |         | Ag. imp, pkgs, 8           | 170    |
| Ag. imp, pkgs, 4   | 60      | Steel, pkgs., 1            | 20     |
| Carriages.....   | 3       | Zinc, pkgs., 5             | 51     |
| Hdw., pkgs., 31  | 795     | Brasil.                    |        |
| Pig iron, tons, 45   | 900     | Hdw., cs., 177             | 2,483  |
| Nails, kegs, 37  | 107     | Mf. iron, pkgs, 164        | 1,596  |
| C'ge mlt, pgs, 29  | 349     | Ag. imp, pkgs, 75          | 414    |
| Mf. iron, pkgs, 13   | 194     | Africa.                    |        |
| London.  |         | Mach'y, cs., 5             | 225    |
| Silverware, cs, 3  | 2,975   | Nails, pkgs., 36           | 608    |
| Hdw., cs., 215   | 4,350   | Iron, bbls., 24            | 313    |
| Mf. iron, pkgs, 230  | 1,008   | Gun stocks, cs, 9          | 277    |
| Mach'y, cs., 100   | 8,039   | Cutlery, cs, 13            | 68     |
| Pt'd ware, cs., 12   | 1,328   | Ag. imp, pkgs, 3           | 682    |
| Pumps, pkgs, 3   | 361     | Grindstones, 63            | 36     |
| Belting, cs., 5  | 1,430   | Pumps, pkgs., 3            | 1,469  |
| Bristol.   |         | Cartridges, cs, 3          | 314    |
| Hdw., cs., 20  | 443     | Guns, cs., 2               | 314    |
| British Honduras.  |         | Iron, bars.....            | 34     |
| Nails, kegs.....   | 17      | Gas fixt., cs, 1           | 32     |
| Cuba.  |         | Hdw., cs., 9               | 1,512  |
| Ag. imp, pkgs, 2   | 16      | Mach'y, pkgs, 71           | 3,560  |
| Tinware, cs., 1  | 27      | Nails, kegs, 260           | 377    |
| R.R.M's, pgs, 538  | 233     | Mf. iron, pkgs, 31         | 758    |
| Saddlery, pgs, 7   | 85      | Iron safe.....             | 128    |
| Hdw., cs., 105   | 5,312   | Firearms, cs, 1            | 160    |
| Lead, pkgs.....  | 23      | Pistols, cs, 3             | 741    |
| Pumps, pkgs., 4  | 1,051   | Revolvers, cs, 4           | 3,173  |
| Iron, bars.....  | 54      | Hayti.                     |        |
| Nails, kegs, 75  | 121     | Iron rails, tons, 7        | 252    |
| G'dstones, 200   | 422     | Mf. iron, pkgs, 18         | 251    |
| Mf. iron, pkgs, 1,193  |         | Nails, kegs, 80            | 769    |
| Selling, bales, 2  | 102     | Powder, lbs., 2000         | 307    |
| Mach'y, pkgs, 135  | 1,028   | Venezuela.                 |        |
| R. R. cars.....  | 3       | Silverware, cs, 1          | 150    |
| Porto Rico.  |         | Hdw., pkgs., 28            | 352    |
| Nails, kegs.....   | 20      | Cutlery, cs., 1            | 35     |
| Hdw., cs., 1   | 90      | Argentina Republic.        |        |
| Ag. imp, pkgs, 13  | 222     | Hdw., cs., 91              | 3,170  |
| Philadelpha.   |         | Car mlt, pgs, 4            | 346    |
| Office of The Iron Age, 220 South Fourth St., Philadelphia, Dec. 17, 1878. |         | Pumps, pkgs, 1             | 170    |

Office of The Iron Age, 220 South Fourth St., Philadelphia, Dec. 17, 1878.

Pig Iron.—We have again to note a fairly active demand at about the same range of prices as quoted since the beginning of the month. Considering the season there is more than an average business doing for immediate delivery, as also one or two important transactions for deliveries extending through 1879, with numerous inquiries of the same character. The general condition of the trade seems to be somewhat encouraging; there are buyers for all standard brands at our inside quotation, with a tendency on the part of sellers to accept orders for small lots at the somewhat higher quotations, rather than enter large orders involving important concessions. Stocks at the leading furnaces are sold close up, and if an accumulation can be avoided during the next six weeks there is no reason to think prices will be lower. At the moment it seems as though the lowest point of depression had been passed. Prices of standard brands are a fraction higher than they were a month ago, and are held, comparatively, with much greater firmness. As usual, there are still some disquieting features to be considered, one being the unsettled condition of the coal trade. Anything gained by the furnace in a reduction in the price of fuel would probably not be used to strengthen themselves, but rather to an equivalent reduction in the price of Pig metal, than which nothing could be more injurious to the trade at large, weakening, as it would be sure to do, the confidence of buyers and opening the way to renewed and disastrous competition among sellers. The moral effect of disorganization in the coal trade can scarcely fail to exert an unfavorable influence on its collateral departments. In the meantime, as stated, the market is steady, and sales are about equal to the offerings at the following quotations, say: Select No. 1 Foundry, \$17.75 @ \$18.50; ordinary Lehigh brands, \$17 @ \$17.50; No. 2, \$16; Gray Forge, \$15 @ \$16; White and Mottled, \$14.50.

Blooms.—Continue dull, and it is difficult to sell large lots. Prices are nominally unchanged, viz.: Blooms (246 lb.), \$38 @ \$39; Northern Ore Blooms (224 lb.), \$33 @ \$37; best quality Charcoal Billets (224 lb.), for wire and steel purposes, \$58 @ \$60; Bars do., \$62.50 @ \$65; Sheet Iron Blooms, cornered (246 lb.), \$53 @ \$55; Cold-Blast Charcoal Plate Blooms, \$50 @ \$53; run-out Anthracite, \$45 @ \$47.50.

Muck Bar.—There is not much doing and sales are difficult to make in quantity, unless at low prices. Sellers ask \$30 @ \$33,

as to quality, with one sale of several hundred tons Refined Bars at something over \$32, equal to Philadelphia delivery.

Structural Iron.—There are plenty of inquiries, with indications of some good orders coming on the market at an early date. Prices are a little irregular, however, and one large order for 2000 tons Beams for delivery in Indianapolis has been accepted at a material concession from quoted rates. As the mills are running off their orders rapidly there is naturally some anxiety for new business, but with indications of increasing demand after the first of the year there is no reason to expect anything but temporary weakness in prices. We quote as before for small lots: Angles, 2.2¢ @ 2.4¢; Tees, 2.4¢ @ 2.5¢; Beams and Channels, 2.7¢ @ 2.8¢.

Plate and Tank Iron.—There is nothing special to report in the general condition of business, and outside of some large transactions in Skelp Iron the market may be considered dull and quiet. The oil pipe line, first mentioned in these columns about two months ago may now be considered definitely settled. One firm in this vicinity has an order for upwards of 3500 tons Pipe, and another something over 2500 tons, the whole making a very important item. There has also been several transactions for Skelp in lots of 100 to 500 tons each, but prices are said to have been cut very low, and in most instances mills at a distance seem to have secured the orders. We hear of an order to-day for 300 tons of Bridge Plate, and inquiries for iron for oil tanks; outside of these there is nothing of importance doing, and prices in all respects are unchanged. We quote as before: Common Plates, 2.2¢ @ 2.3¢; Tank Iron, 2.3¢ @ 2.5¢; C. No. 1, 2.4¢ @ 2.6¢; Shell Iron, 2.5¢ @ 2.9¢; Flange Iron, 3.7¢ @ 4¢; Solid Firebox, 4.85¢ @ 5¢, and Best Bloom, 5.5¢ @ 6¢.

Sheet Iron.—Business is falling off considerably, and sales continue to be of small lots for immediate consumption. Prices as a rule are unchanged, but we are advised of a sale of 1000 bundles for March delivery at an advance of \$1 per ton on price realized for a smaller lot, recent deliveries. We quote: Common Sheet, No. 20 to 23, 2.8¢ @ 2.9¢; No. 24 to 26, 2.9¢ @ 3¢; No. 27 to 28, 3.1¢ @ 3.15¢; Best Refined Sheet, No. 25 to 28, 3.2¢ @ 3.3¢; No. 22 to 24, 3.1¢ @ 3.2¢; No. 16 to 21, 3¢ @ 3.1¢; Best Bloom Sheets, No. 25 to 28, 5.2¢ @ 5.3¢; No. 22 to 24, 5¢; No. 16 to 21, 4.7¢ @ 4.8¢; Refined Plates or Blue Annealed, 5-16 to 16, 2.3¢ @ 2.4¢; American, R. G., 5-16 to 16, 2.9¢ @ 3¢; Best Bloom, 5-16 to 16, 4.8¢ @ 4.9¢; A Patent Planished, 10½¢; B Patent Planished, 9½¢; Best Bloom Galvanized, 45¢ discount; second quality, 55¢; extra discounts for large lots.

Bar Iron.—The condition of the trade is not materially changed since date of our last report. A fair amount of orders have been entered, and a still larger amount of business is ready to be placed at a price. The disorganization of the Bar trade is about as complete as it can be, and the opinion is freely expressed that the time has arrived when some concerted action should be taken to prevent utter demoralization. There seems to be a reasonable prospect of an increased consumption, but unless some basis of values can be agreed upon, neither manufacturer, merchant or consumer are likely to gain much by what ought to be the means of bringing a decided improvement in trade. One of the chief causes of complaint is in the cutting of extras. In other words, there is no regular price for anything, and under the present dispensation there is no means for a seller to know what to ask, or what to refuse, or for a buyer to know what to give, or what to offer. Business has therefore resolved itself into a kind of private arrangement for every transaction. The buyer makes out his list and obtains bids from competing firms. The lowest bids on each size are taken down and sellers informed that the party can buy at such and such prices. The inference is that the one addressed must either make further concessions, or, if he gets the order at all, it is by special favor. The fact may be that no one firm had any idea of taking the order at any such price, although separately the items might have been so offered. One would offer one size low, another would be low on another size, &c. The result is demoralization to the seller; he gets the impression that he must meet the market, down goes his price, to be followed immediately by equal competition from his neighbor, and so on all around. If manufacturers were the only sufferers the matter might be left to work its own cure, but dealers and consumers are equally affected. It causes uncertainty as to values, and dissatisfaction in every direction, and so long as this condition of affairs continues it is almost impossible to expect permanent improvement in business. A uniform classification seems to be an urgent necessity, and as we have heard frequent expressions from leading firms of a desire to have the matter carefully considered, we make this reference to it, and would be glad to be the medium of any communications bearing on the subject. The present seems to be a favorable time for action, and we trust something will be done at once. In this connection we may also refer to another need of the trade, viz., an Iron exchange. Such an institution would be invaluable to the Iron interests. Other trades have their exchanges, and regard them as indispensable. The enormous interests connected with the Iron trade would be vastly strengthened by such an organization, while in point of convenience it could scarcely be overestimated. By it business would be stimulated; buyers and sellers would be attracted to it as a common center, instead of being scattered over miles of territory as at present. The trade admit the necessity of such an organization; many of the leading capitalists desire it and promise to support it, and we trust it will be one of the good things to be realized early in the new year.

Steel Rails.—The market is somewhat irregular, owing to the eagerness of one or two mills to obtain certain contracts, which they regard as specially desirable. This has led to a slight shading in prices, which others may possibly follow, so that in the mean time the market cannot be quoted as firm as it was a week ago. The position has been defined in our late reports, and so far as can be seen there is still every reason to think that the business of the ensuing year will be equal to the capacity for production, although buyers of large lots are holding off longer than usual, hoping by so doing to place their orders on better terms than can be done at the moment. It is understood that concessions have been made in recent transactions, but as the mills are filling up with work it is scarcely likely that prices will yield any further. Buyers are reluctant about paying an advance on rates current a year ago, but there is little doubt they will have to do so, as the Rail trade is in a much better condition than it was at that time. We continue our late quotations, say \$41 @ 43 at mills, with sales for upward of 10,000 tons at slightly lower rates than were named a week ago.

Steel Blooms.—Slabs are quoted at \$42 @ \$46, and Billets at \$48 @ \$50.

Iron Rails.—There is a continued good demand, and the mills are entering week by week about as many Rails as they can turn out. Some little falling off in the demand may be looked for at this season, but inquiries are numerous, and if the collaterals are acceptable several good-sized orders may be placed at an early date. Prices are unchanged, say \$32.50 @ \$35 at mill, according to location, section of Rail and terms of payment.

Old Rails.—The scarcity recently noted seems to have become more general, and at the moment we do not hear of any spot lots being offered, while buyers are looking for supplies with considerable anxiety. In the absence of actual transactions prices are nominal, but \$20 @ \$20.50, cash, would be freely paid for prompt deliveries of good average qualities.

Spikes.—The demand continues good, and prices steady as follows: 5½ x 9-16, 2¢; ¾ x 4 and longer, 2.3¢; 7-16 x 4 and longer, 2.4¢; ¾ x 3½ and longer, 2.7¢; ¾ x 3 and longer, 2.8¢.

Scrap Iron.—The market is quiet, but very little stock is offered, and full prices are obtained for selected qualities. We quote: Cast, \$13.50 @ \$15; Wrought, \$20 @ \$22.50.







## INDUSTRIAL ITEMS.

## MASSACHUSETTS.

The Valley Machine Company at Northampton have just shipped 10 of their steam pumps to San Francisco and four to Galveston, Texas.

The corundum wheel, which was referred to last week as being preserved by F. B. Norton, of Worcester, as a sample of the results which can be achieved by the wheels of his manufacture, ground the grooves of 300 pistons—or 1500 grooves in all—instead of 300 grooves, as incorrectly reported.

## CONNECTICUT.

The Northfield Knife Company have lost but a few weeks of time since their organization, about 20 years ago.

Durban Brothers, clock spring manufacturers, are working overtime at Bristol. There is an improvement in business indications at Thomaston. All of the factories of the Seth Thomas Clock Company are running full time, and nearly all of the hands discharged during the summer are at work again. The Plume and Atwood Company's brass mill is running ten hours per day—which had not been the case for any length of time for over a year—with prospects of good business for the winter. The American Knife Company are busy, employing over 80 workmen.

## PENNSYLVANIA.

We clip the following from the Sharon Herald of the 7th inst.: At the Kimberly Mill, puddle, bar, guide and the 8-inch (old) hoop mill double turn, 9-inch (new) hoop mill single turn, nail plate mill and nail factory on till Saturday. At Sharpsville Spearman No. 2 and Douglass No. 2 both doing well.

For the four weeks ending Saturday, Dec. 7, there were made at the nail factory of the Pottstown Iron Company 11,336 kegs of nails. Fifty-four machines did the work. The other departments of the company are also busy.

## PITTSBURGH AND VICINITY.

It is expected that the new rolling mill at McKeesport will start up about the 1st of April next year.

## WEST VIRGINIA.

The nail mills at Wheeling are all running full time at present.

## OHIO.

The Delaware Fence Company, of Delaware, are filling one order this week for 250 of their wrought-iron shifting rails for buggy seats (Fritch's patent), and have other orders from all parts of the country. Those already used have given universal satisfaction. This rail is a light, stylish, ingenious, as well as strong and economical device, readily adjusted to the seats of buggies, and so arranged in sections as to be easily repaired when broken, these sections being screwed into couplings and thus held securely and firmly to their place. This company also manufacture Reichert's wrought-iron fence, which continues to be a favorite style and in great demand.

The Dover Brass Foundry manufactured about 1000 farm and school-house bells last season.

William H. Parkin & Co., file manufacturers, Cleveland, are running on full time, employing 20 men, and intend to increase their capacity. They make a specialty of horse rasps.

The Dover Fire-brick Works are employing 21 men, turning out 6000 bricks per day. They have recently enlarged their works by extending their building, and are to begin early in the spring the manufacture of fire-proof building material.

The furnace of Tuscarawas Coal and Iron Company at Canal Dover has been idle for some three years. About a month ago work was commenced in it to rebuild and enlarge it to three times its former capacity at a cost of over \$35,000.

For the week ending Dec. 7, 15,169 kegs of nails were received at Cincinnati, making 132,980 kegs since the 1st of September, as against 104,114 for the same time last year.

The officers of the Mingo Iron Company, at Steubenville, have been exonerated from any bad faith or "crookedness" in the management of the company's affairs.

The Globe Mill, at Cincinnati, is running full, single turn, in the puddle, sheet, bar, guide and wire departments at present. Mitchell, Trante & Co.'s mill at the same place is on full in all departments.

All the furnaces of Jackson are idle. The Standard says Milton and Wellston furnaces will soon blow out also.

Messrs. P. Hayden & Sons' mill, at Columbus, before the explosion there was running full time. The finishing mill was on double, the balance single. The Columbus rail mill has been very busy rolling old rails, averaging about half time.

## INDIANA.

The Capital City Mill at Indianapolis is still idle.

The Indianapolis rail mill is busy. They are running all departments double turn, and are rolling old rails. It is said the mill will run all winter.

The Ohio Falls Works, New Albany, are running full, single turn, making merchant iron. The nail factory has done little or nothing for over six months.

## MISSOURI.

The Vulcan Iron Works at South St. Louis are still idle.

The Laclede Mill at St. Louis is running full, double turn, in all departments. This mill was running triple turn some weeks ago.

## MICHIGAN.

The mill at Wyandotte is running about half time, except the rail mill, which has been idle for several years. A bar mill and guide mill have been added to the Baugh Steam Forge Company's works at Spring Wells, and there are prospects of other improvements being added in the near future. The mill is running full time.

## ILLINOIS.

The rail mill at Springfield is running full, double turn. The puddle department is still idle. The new mill, recently built to make merchant iron and fish bar, started up a few days ago.

The mill of Messrs. Jos. H. Brown & Co., at South Chicago, is running to its fullest capacity in all departments.

## KENTUCKY.

From the Greenup Independent of Dec. 13, we get the following: Bellefonte will cut from 10,000 to 12,000 cords of wood this season. J. W. Hall & Co., of the Mayville Plow Works, have shipped south not less than 8000 plows during the last six months. Pennsylvania Furnace blew out Monday, the 9th inst.

The Princess Furnace is now working better than ever before, making a daily yield of from 16 to 17 tons of good foundry iron, the improvement being accredited to the use of a stone hearth in place of a fire-brick one. The question therefore naturally arises, as it has before in several parts of the Hanging Rock region, Does a stone furnace inside better answer for the reduction of our sulphurous and phosphorus ores than one of brick? And as this proposition seems to be answered in the affirmative by practical tests in several instances, the next question is, Why is this so?—Greenup Independent. May it not be that the bricks were not the best for working with these ores? Might not other brands of brick work better?

## TENNESSEE.

Union county zinc mines have shipped some 400 tons of ore from their works to New York since December 1.

The blooming train of the Roane Iron and Steel Company's Works has been put in working order and is performing satisfactorily. The company have an order for steel rails which they will fill at once.

The Southern States Coal Iron and Land Company have found the true vein of coal on their Victoria property in Marion county. The coal shows a face of over five feet, lays in excellent shape for ease and cheapness of mining, and is of similar quality and character with Sewanee.

Brownport Charcoal Furnace, situated 3 miles from the Tennessee River, claims to make iron at \$11 per ton, as follows:

|                                    |         |
|------------------------------------|---------|
| 2 tons iron                        | \$2.50  |
| 4 ton limestone                    | 15      |
| 135 bushels of charcoal at 4 cents | 5.40    |
| Labor and superintendence          | 2.75    |
| Repairs                            | 20      |
| Total                              | \$11.00 |

## GEORGIA.

Rising Fawn Furnace was banked in most of the week ending 14th inst., to enable the operatives to repair the hot blast.

## Mining and Mineral Items.

## COAL.

For some months the Philadelphia Coal Company have been prospecting for coal at Rappahannock Station, in close proximity to the Philadelphia and Reading Railroad. Rappahannock Station, or the "Rap," as it is familiarly called by those who reside in the neighborhood, is located on the Shenandoah branch of the Philadelphia and Reading road, about four miles from Shenandoah and one mile from Mahanoy Plane. There are at present no collieries nearer the point than those located in the borough of Girardville or on its outskirts. It is reported that the prospectors have made a "find," a big one at last accounts, no less than a vein 30 feet in thickness. Should the news be verified, the "Rap" will increase in importance as well as population.—Potterville Journal.

Work was recently resumed in the large coal shaft of the Northern Illinois Coal and Iron Company, which has not been operated since last winter.

Nearly all the collieries operated by the Philadelphia and Reading Coal and Iron Company at Shamokin, Pa., have resumed operations.

The Central Mining Company are at New Straitsville running their works to the fullest capacity.

The Pacific Slope mines at Hermitage, Pa., have again started after an idleness of several months.

The Morgan Coal Works at Latrobe, Pa., are still idle. The Loyallhanna, Coketon and Millwood coke works are being operated to their fullest capacity.

An explosion of nitro-glycerine and gunpowder occurred at St. Bernard coal mines at Earlington, Kentucky, last Friday. The shock was felt for miles. A train of mining cars, the mules and a negro driver were blown to atoms. There was a panic among the miners and their families.

The output of coal in the Cumberland, Md., region for the week ending November 30 was 37,582 tons. For the same week last year, 10,012 tons; an increase of 27,569 tons. Total for the year to date, 1,570,723 tons; same time last year, 1,449,122 tons, an increase of 124,600 tons.

## IRON.

We take the following from the Marquette Mining Journal of the 30th ult.: The Republic has closed the season with a grand total production of 176,221 tons, all shipped via Marquette. Total shipments of all our mines up to the 27th ult., 1,069,798 tons. Shipments yet to be made, together with shipments by rail south of Escanaba and to local furnaces, will increase these figures to at least 1,100,000 tons. The shipping season has not yet closed via Escanaba, and one week more like the last will bring the shipments from that port up to Marquette's figures. The shipments from there last week were 10,561 tons.

The Berks County Mining Company is the name of a new mining company which has just been organized in the eastern portion of Berks county, Pa., with George Reidenauer, Nicholas Andre, Amandus Bitner and John T. Dyer as members. Mr. Bitner is the president, Mr. Andre, secretary, and Mr. Dyer superintendent. The object of the company, as stated in their charter, is to search for minerals, conduct mining and quarrying operations and excavate minerals, particularly iron ore. The capital stock is \$10,000. The company own mineral lands and iron ore leases in Olney and Rockland townships.

A meeting of the heaviest capitalists and most prominent business men representing the iron ore and vessel interests of Cleveland, was held on Thursday last, the object of which was to promote influences to secure the improvement of the harbor of Duluth, and hasten all such improvements as will give the largest sized vessels free and uninterrupted navigation through the great lakes.

Delegates to a similar meeting to be held at St. Paul on the 18th inst. were elected. The Gabel iron ore mine at Boyertown, Pa., has now reached a depth of 353 feet. It is expected to strike the Boyertown vein at about 400 feet.

From the Marquette Mining Journal we take the following table giving the total shipments of iron ore by lake and rail for the season of 1878, just closed by the cessation of navigation:

| Name of mine                 | Gross tons. | Name of mine       | Gross tons. |
|------------------------------|-------------|--------------------|-------------|
| Republic                     | 176,221     | Cleveland hematite | 9,317       |
| Cleveland                    | 143,480     | Norway             | 7,976       |
| Lake Superior                | 102,534     | Bessemer           | 8,506       |
| Jackson                      | 83,121      | Goodrich           | 7,547       |
| Champion                     | 73,464      | Cyclops            | 6,628       |
| Saginaw                      | 61,237      | Keystone           | 5,401       |
| Michigan                     | 58,622      | Palmer             | 4,704       |
| Salisbury                    | 52,155      | Brown              | 4,694       |
| Vulcan                       | 38,799      | Marquette          | 4,390       |
| McComber                     | 30,150      | Mitchell           | 4,259       |
| Rolling Mill                 | 30,773      | National           | 4,191       |
| Pittsburgh and Lake Angeline | 28,161      | N. Y. hematite     | 4,547       |
| Barnum                       | 26,680      | Canby              | 3,754       |
| Quinnesec                    | 25,595      | Pendill            | 3,385       |
| Humboldt                     | 23,920      | Spurr              | 2,217       |
| Winthrop                     | 23,740      | Manganese          | 2,003       |
| New York                     | 21,903      | Steward            | 1,690       |
| Smith                        | 18,994      | Howe               | 1,225       |
| Emmett                       | 18,593      | Morgan             | 10          |
| Edwards                      | 10,351      | Total              | 7,124,991   |

The following is a detailed statement of the iron ore, pig iron and quartz rock shipped from the ports of Marquette, L'Anse and Escanaba to lower lake ports during the season of 1878, up to and including the 1st day of December:

| Name of mine | Gross tons. | Name of mine                   | Gross tons. |
|--------------|-------------|--------------------------------|-------------|
| Republic     | 176,221     | Edwards                        | 10,351      |
| Cleveland    | 143,480     | Ten other mines                | 3,385       |
| Jackson      | 83,121      | shipping less than 10,000 tons | 25,273      |
| Champion     | 73,464      | Total                          | 554,127     |
| Rolling Mill | 30,773      |                                |             |
| Humboldt     | 23,920      |                                |             |
| McComber     | 17,883      |                                |             |

| Name of mine | Gross tons. | Name of mine      | Gross tons. |
|--------------|-------------|-------------------|-------------|
| Michigan     | 58,622      | Steward           | 1,130       |
| Spurr        | 2,217       | Total ore, L'Anse | 42,186      |

| Name of mine                 | Gross tons. | Name of mine                   | Gross tons. |
|------------------------------|-------------|--------------------------------|-------------|
| Jackson                      | 83,121      | Smith                          | 26,984      |
| Saginaw                      | 61,237      | Lake Superior                  | 19,865      |
| Salisbury                    | 52,155      | Winthrop                       | 13,146      |
| Vulcan                       | 38,799      | McComber                       | 10,351      |
| Barnum                       | 26,680      | Emmett                         | 10,198      |
| Pittsburgh and Lake Angeline | 28,161      | 16 other mines                 | 67,050      |
| Cleveland                    | 23,920      | shipping less than 10,000 tons | 67,050      |
| Quinnesec                    | 25,595      | Total                          | 506,903     |
| New York                     | 21,903      |                                |             |
| Michigan                     | 18,593      |                                |             |

Statement of iron ore, pig metal, quartz and limestone transported over the M., H. & O. R. R., from Jan. 1 to Nov. 30, 1878, inclusive:

| Name of mine  | Gross tons. | Name of mine   | Gross tons. |
|---------------|-------------|----------------|-------------|
| Republic      | 176,221     | Humboldt       | 23,920      |
| Cleveland     | 143,480     | McComber       | 17,883      |
| Lake Superior | 87,422      | Edwards        | 10,351      |
| Champion      | 73,464      | 10 other mines | 20,539      |
| Michigan      | 58,622      | Total          | 618,600     |
| Rolling Mill  | 30,773      |                |             |

The following table shows the total amount of iron ore, pig metal and quartz transported over the Peninsula Division of the Chicago and Northwestern Railway during the season of 1878:

| Name of mine                 | Gross tons. | Name of mine   | Gross tons. |
|------------------------------|-------------|----------------|-------------|
| Jackson                      | 83,121      | Michigan       | 18,593      |
| Saginaw                      | 61,237      | Smith          | 16,024      |
| Salisbury                    | 52,155      | Lake Superior  | 15,063      |
| Vulcan                       | 38,799      | Winthrop       | 13,146      |
| Barnum                       | 26,680      | McComber       | 10,351      |
| Cleveland                    | 23,920      | Emmett         | 10,198      |
| Pittsburgh and Lake Angeline | 28,161      | 16 other mines | 61,104      |
| Quinnesec                    | 25,595      | Total          | 593,944     |
| New York                     | 21,903      |                |             |

FIG. IRON.

| Name of mine                | Gross tons. | Name of mine | Gross tons. |
|-----------------------------|-------------|--------------|-------------|
| Carp River Furnace          | 4,258       |              |             |
| Pioneer                     | 3,882       |              |             |
| Iron Cliffs                 | 100         |              |             |
| Total pig iron              | 8,240       |              |             |
| By M., H. & O. R. R.        |             |              |             |
| Carp River Furnace          | 4,142       |              |             |
| Pioneer                     | 3,602       |              |             |
| Iron Cliffs                 | 100         |              |             |
| Total pig iron              | 8,144       |              |             |
| By P. Div. C. & N. W. R. R. | 2,370       |              |             |
| Grand total                 | 18,644      |              |             |

One or two of the pits at the McComber yield a very fine quality of manganese ore, which is readily sold at a very considerable advance over the prices paid for hematites, and which is used in the manufacture of spiegel iron for Bessemer steel purposes. The developments at the McComber and on adjoining properties the past year give assurance of an increased product of this class of ore next season, and certainly an increased importance to the Negaunee hematite range.

## PRECIOUS METALS.

Benjamin Newell, of Dalton, and Almon Bassett, of Pittsfield, Mass., who have leased 75 acres of land just north of Dalton, are exhibiting some specimens of silver quartz which they are having assayed, some of it producing at the rate of \$200 a ton. Boston parties have recently been there and taken away a considerable quantity of amber, which is found in abundance and easily taken out, and they pronounce it equal to the finest burnt amber, even in its natural state. The lessees are preparing to go into mining extensively in the spring.

**B. W. PAYNE & SONS,**  
Corning N. Y.  
Established in 1840.  
**Eureka Safety Power.**  
h.p. cyl. ht. space. wt. price.  
2 3/4 4 1/2 11 40x35 900 \$150  
3 3/4 5 1/2 12 40x35 1100 200  
4 3/4 6 1/2 12 40x35 1200 250  
Also, Spark Arresting Portables and Stationary Engines for Plantations. Send for Circulars.

**NONESUCH**  
Self Locking and Burglar Proof Window Locks.  
Cheapest and best in the market. Send for sample, price list &c., to  
**FRED. J. HOYT**  
733 Broadway, N. Y.

# COULTER, FLAGLER & CO.,

87 Chambers and 69 Reade Sts., New York,  
Hardware Manufacturers' Warehouse.



## THE TURNER & EYMOUR MFG. CO.,

MANUFACTURERS OF

### Upholsterers', Stationers', House Furnishing and Fancy HARDWARE AND NOTIONS.

Fancy Brass Goods and Small Iron Castings to order.

SPECIALTIES.

Shade Fixtures and Trimmings in great variety.  
Picture Nails, Knobs, Hooks, Cord, Wire, &c.  
Ink Stands of Superior Finish.  
Twine Boxes, Escutcheon Pins, Curtain Rings, Nutmeg Graters.  
The Best American Cast Scissors and Shears.

Both Floors revolve, giving the double motion necessary to a perfect beater.

FACTORIES, Wolcottville, Conn. WAREHOUSE, 81 Reade Street, New York.



**COVERT'S HORSE AND MULE JEWELRY.**  
Consisting of Covert's Celebrated Harness Snaps, Swivel Snaps, Open Eye Bit and Chain Snaps, Snap and Thimble for Horse and Cattle Ties, Rope Goods consisting of Horse Ties, Cattle Ties and Halter Leads, Leather Horse Ties, Breast Chains, Halter Chains, Martingale Chains, Rein Chains, Post Chains, Post Rode, &c. These goods are far superior to anything of the kind on the market. They have from real metal become standard, and never fail to give entire satisfaction. They are sold by all leading jobbers in general and saddlery hardware at manufacturers' prices. Special attention is called to our new patented Rope Goods. No more braiding or winding ends with cord; all accomplished with machinery by clamping the rope with steel rings, which enables us to make better goods at reduced prices. Send for catalogue and price list. Address **COVERT MFG. CO.,** Sole Manufacturers, Troy, N. Y.

## A "NEW COMBINATION."

**THE Family TACKS & NAILS.**  
SOMETHING NEW AND USEFUL.  
THE FAMILY ASSORTMENT OF TACKS & NAILS.  
SEND FOR SAMPLES OR DESIGNS BY CIRCULAR.  
PUT UP & SOLD AT 50 CENTS PER DOZEN BY  
**DUNBAR, HOBART & WHIDDEN,**  
FACTORY, 20, ABBINGTON STATION, MASS.  
WAREHOUSE, 16 CHAMBERS ST., NEW YORK CITY.  
A LIBERAL DISCOUNT TO THE TRADE.

## TACKS & NAILS.

### D. K. MILLER LOCK CO.,

712 Cherry St., Philadelphia.

Greatly improved. Prices reduced. As now made it is the best and most economical Pad Lock for all uses extant. Appreciated by all who use them. For simplicity, compactness, durability, convenience and security it has no equal. Springs now made from the celebrated Phosphor Bronze. We make these Locks with Master Keys when so ordered. Largely used by the U. S. Government, Railroads, Corporations, etc., etc. Samples of 2 1/2 in. size sent per mail on receipt of one dollar.

**Bergen Port Spelter.**  
MINES: Lehigh Valley, Pa. WORKS & FURNACES: Bergen Port, N. J.  
The only Miners and Manufacturers of  
**PURE LEHIGH SPELTER,**  
From Lehigh Ore.  
Warranted free from any trace of Lead, and especially adapted for  
Cartridge Metal and German Silver.  
Also manufacturers of  
**BERGEN PORT OXIDE ZINC,**  
Superior for LIQUID PAINT on account of its body and wearing properties.  
**F. OSCOOD & CO.,** Proprietors.  
E. A. FISHER, Agent, 13 Burling Slip, N. Y.







# AMERICAN SCREW CO.,

Providence, R. I.,

## MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,

AND INCREASING THE ASSORTMENT DAILY.

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

### INTERNATIONAL EXHIBITION. PHILADELPHIA, 1876.

(No. 235.)

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, November 8, 1876.

#### REPORT ON AWARDS.

Product: Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz: **Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.**

G. L. REED, Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz,  
Jas. Bain,  
Chas. Staples,

G. L. Reed,  
J. D. Imboden,

J. Diffenbach,  
Dav. McHardy.

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.  
Given by authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General.

J. R. HAWLEY, President.

[L.S.] J. L. CAMPBELL, Secretary.



After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

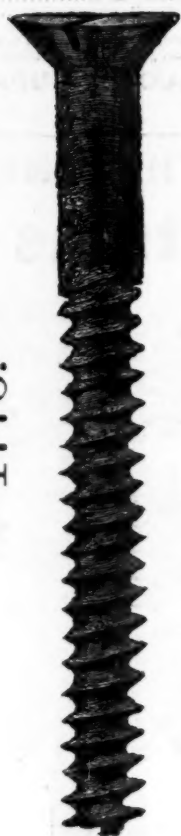
The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

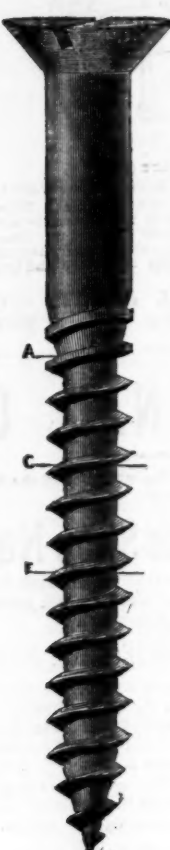
Experience has shown that the wear point of screws, as formerly made, is at the heel of the thread, where all

1776.



1846.

Patented August 30.



Section at Line A B

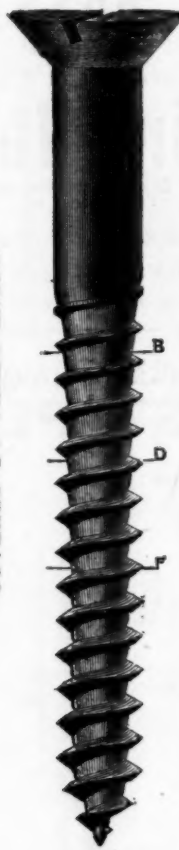
Section at Line C D

Section at Line E F

1876.

Patented May 30.

COVERED BY TRADE MARK.



Section at Line A B

Section at Line C D

Section at Line E F

Estimated to be FIFTY PER CENT. stronger than a Screw as

the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

#### CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."



# The Iron Age Directory

and Index to Advertisements.

PAGE

**Agricultural Implements.**  
Hubbard H. W., 221 N. Y. 24

**Air Compressors.**  
Clayton, James, 11 Water, Brooklyn, N. Y. 3

**Alarm Money Drawers.**  
Tucker & Dorsey, Indianapolis, Ind. 30

**Anti-Friction Metals.**  
Revere Paul S., Philadelphia. 36

**Anti-Incinerator.**  
S. B. Briscoe & Co., Potomac, Md. 36

**Anvils, Manufacturers of.**  
Fisher & Norris, Trenton, N. J. 32

**Angers, Bits, etc., Manufacturers of.**  
Richardson Mfg. Co., Worcester, Mass. 24

**Angers, Bits, etc., Manufacturers of.**  
Clark Wm. A., Westville, Conn. 24

**Angers, Bits, etc., Manufacturers of.**  
Cona Valley Iron Co., Chambers, N. Y. 24

**Angers, Bits, etc., Manufacturers of.**  
D. R. Barton Tool Co., Rochester, N. Y. 7

**Angers, Bits, etc., Manufacturers of.**  
Jones M. H. & Co., Cohoes, N. Y. 21

**Angers, Bits, etc., Manufacturers of.**  
Brown & Arthur, Fishersville, N. H. 13

**Angers, Bits, etc., Manufacturers of.**  
Cook R. & Sons, Winsted, Conn. 13

**Angers, Bits, etc., Manufacturers of.**  
Hochstetler Guy C., Field & Co., Brooklyn, E. D. 31

**Angers, Bits, etc., Manufacturers of.**  
Sheldon & Co., Auburn, N. Y. 5

**Angers, Bits, etc., Manufacturers of.**  
Wilson, Walker & Co., Pittsburgh, Pa. 5

**Angers, Bits, etc., Manufacturers of.**  
Barb Wire.  
Thorn Wire Hedge Co., 34 Canal, Chicago. 2

**Angers, Bits, etc., Manufacturers of.**  
Bellevue, Manufacturers of.  
Newcomb Bros., Chambers, N. Y. 25

**Angers, Bits, etc., Manufacturers of.**  
Scott Geo. M., Chicago, Ill. 24

**Angers, Bits, etc., Manufacturers of.**  
Bells (Sleigh).  
Bever Bros. Mfg. Co., Easthampton, Conn. 18

**Angers, Bits, etc., Manufacturers of.**  
Belling, Leather, Makers of.  
Alexander Bros., Chambers, N. Y. 31

**Angers, Bits, etc., Manufacturers of.**  
Forepaugh Wm. F., Jr., & Bros., Philadelphia. 31

**Angers, Bits, etc., Manufacturers of.**  
Bird Cages, Makers of.  
Lindeman O. & Co., 24 Pearl, N. Y. 3

**Angers, Bits, etc., Manufacturers of.**  
Maximilian Tool Co., Providence, R. I. 13

**Angers, Bits, etc., Manufacturers of.**  
Bit Bars, Manufacturers of.  
Millers Falls Mfg. Co., 74 Chambers, N. Y. 31

**Angers, Bits, etc., Manufacturers of.**  
Blind Staples.  
Halt J. Lloyd, & John, N. Y. 21

**Angers, Bits, etc., Manufacturers of.**  
Blocks, Tackle, Makers of.  
Burr & Co., 37 West Slip, N. Y. 11

**Angers, Bits, etc., Manufacturers of.**  
McMillan Wm. H. & Bro., 113 South, N. Y. 10

**Angers, Bits, etc., Manufacturers of.**  
Penfield Block Works, Lockport, N. Y. 33

**Angers, Bits, etc., Manufacturers of.**  
Providence Tool Co., Providence, R. I. 13

**Angers, Bits, etc., Manufacturers of.**  
Wetzel John, 7 and 9 Bedford, N. Y. 29

**Angers, Bits, etc., Manufacturers of.**  
Belt Cutters.  
Howard Iron Works, Buffalo, N. Y. 34

**Angers, Bits, etc., Manufacturers of.**  
Stockwell Screw and Machine Co., Cleveland, O. 34

**Angers, Bits, etc., Manufacturers of.**  
Wiley & Russell, Greenfield, Mass. 34

**Angers, Bits, etc., Manufacturers of.**  
Belts, (Corrugated Belt).  
Rivet Buck Co., Chicago, Ill. 33

**Angers, Bits, etc., Manufacturers of.**  
Belts (Screw).  
East Bolt Works, Philadelphia. 33

**Angers, Bits, etc., Manufacturers of.**  
Boat and Shoe Heel Stiffeners.  
Lyon N., Albany, N. Y. 13

**Angers, Bits, etc., Manufacturers of.**  
Brass Butts, Makers of.  
Tiebout W. & J., 250 Pearl, N. Y. 13

**Angers, Bits, etc., Manufacturers of.**  
Brass, Manufacturers of.  
Ansonia Brass and Copper Co., 19 Cliff, N. Y. 2

**Angers, Bits, etc., Manufacturers of.**  
Bridgeport Brass Co., Bridgeport, Conn. 2

**Angers, Bits, etc., Manufacturers of.**  
Brass Goods Mfg. Co., Chambers, N. Y. 31

**Angers, Bits, etc., Manufacturers of.**  
David John & Sons, John, N. Y. 31

**Angers, Bits, etc., Manufacturers of.**  
Holmes, Booth & Hayden, 49 Chambers, N. Y. 2

**Angers, Bits, etc., Manufacturers of.**  
Manhattan Brass Co., 88 Reade, N. Y. 2

**Angers, Bits, etc., Manufacturers of.**  
Plume & Atwood, Chambers, N. Y. 2

**Angers, Bits, etc., Manufacturers of.**  
Scovill Mfg. Co., 41 Broome, N. Y. 2

**Angers, Bits, etc., Manufacturers of.**  
Waterbury Brass Co., 256 Broadway, N. Y. 2

**Angers, Bits, etc., Manufacturers of.**  
Brass Foundries.  
Revere Paul S., Philadelphia. 36

**Angers, Bits, etc., Manufacturers of.**  
Broad Mixer and Kneader.  
Stanyan Co., 75 High, Boston, Mass. 19

**Angers, Bits, etc., Manufacturers of.**  
Bridge Builders.  
Moseley Iron Bridge and Roof Co., 4 Dey, N. Y. 33

**Angers, Bits, etc., Manufacturers of.**  
Brick Saws.  
Boydton E. M., 20 Beekman, N. Y. 33

**Angers, Bits, etc., Manufacturers of.**  
Butcher and Shoe Knives, Manufacturers of.  
Wilson John, Sheffield, England. 33

**Angers, Bits, etc., Manufacturers of.**  
Butts and Hinges.  
American Spiral Spring Butt Co., 83 Beekman, N. Y. 25

**Angers, Bits, etc., Manufacturers of.**  
Sabin Mfg. Co., Montpelier, Vt. 9

**Angers, Bits, etc., Manufacturers of.**  
Stanley Works, New Britain, Conn. 27

**Angers, Bits, etc., Manufacturers of.**  
Union Mfg. Co., 28 Chambers, N. Y. 7

**Angers, Bits, etc., Manufacturers of.**  
Calipers.  
Victor Sewing Machine Co., Middletown, Conn. 10

**Angers, Bits, etc., Manufacturers of.**  
Carriage Belts, Makers of.  
Townsend, Wilson & Hubbard, Philadelphia. 12

**Angers, Bits, etc., Manufacturers of.**  
Carriage Hardware, Makers of.  
Hayden & Sons, Albany, N. Y. 12

**Angers, Bits, etc., Manufacturers of.**  
Pim Richard P., Wilmington, Del. 6

**Angers, Bits, etc., Manufacturers of.**  
Smith H. D. & Co., Plainville, Conn. 12

**Angers, Bits, etc., Manufacturers of.**  
Struffer C. & Co., 62 West, N. Y. 4

**Angers, Bits, etc., Manufacturers of.**  
Wilcox & Howe, Birmingham, Conn. 4

**Angers, Bits, etc., Manufacturers of.**  
Carriage Springs.  
Home Trestle Co. (Limited), Rome, N. Y. 28

**Angers, Bits, etc., Manufacturers of.**  
Dexter Spring Co., Hulton, Pa. 28

**Angers, Bits, etc., Manufacturers of.**  
Car Axles.  
Roberts A. & P. Co., 265 S. 4th, Philadelphia. 5

**Angers, Bits, etc., Manufacturers of.**  
Casters.  
Phonix Caster Co., Indianapolis, Ind. 30

**Angers, Bits, etc., Manufacturers of.**  
Caulking Iron.  
Carver John, 28 Monroe, N. Y. 11

**Angers, Bits, etc., Manufacturers of.**  
Chisels, Manufacturers of.  
Buck Bros., Millbury, Mass. 33

**Angers, Bits, etc., Manufacturers of.**  
Clocks, Springs, &c.  
Cary & Moon, 24 W. 29th, N. Y. 3

**Angers, Bits, etc., Manufacturers of.**  
Dunbar Bros., Bristol, Conn. 3

**Angers, Bits, etc., Manufacturers of.**  
Clothes Pins, (Metallic).  
Broder J. L. & Son, 286 Greenwich, N. Y. 34

**Angers, Bits, etc., Manufacturers of.**  
Coal, Makers of.  
Pardee A. & Co., 111 Broadway, N. Y. 6

**Angers, Bits, etc., Manufacturers of.**  
Tennessee Coal & Railroad Co., Tracy City, Tenn. 6

**Angers, Bits, etc., Manufacturers of.**  
The Hoboken Coal Co., Jersey City, N. J. 6

**Angers, Bits, etc., Manufacturers of.**  
Coal Hods.  
Esterbrook, Wm. Philadelphia, Pa. 24

**Angers, Bits, etc., Manufacturers of.**  
Pierce Geo. M. & Co., Buffalo, N. Y. 34

**Angers, Bits, etc., Manufacturers of.**  
Coal Vases.  
Sidney Shepard & Co., Buffalo, N. Y. 27

**Angers, Bits, etc., Manufacturers of.**  
Coffee and Spice Mills.  
Lane Brothers, Millbrook, N. Y. 28

**Angers, Bits, etc., Manufacturers of.**  
Enterprise Mfg. Co., Philadelphia, Pa. 23

**Angers, Bits, etc., Manufacturers of.**  
Compasses and Dividers, Manufacturers of.  
Bemis & Call Hardw. & Tool Co., Springfield, Mass. 20

**Angers, Bits, etc., Manufacturers of.**  
Coopers' Tools, &c., Manufacturers of.  
D. R. Barton Tool Co., Rochester, N. Y. 7

**Angers, Bits, etc., Manufacturers of.**  
Copper.  
The New Haven Copper Co., 255 Pearl, N. Y. 2

**Angers, Bits, etc., Manufacturers of.**  
Corn Huskers.  
Chambers, Bering & Quinlan, Decatur, Ill. 28

**Angers, Bits, etc., Manufacturers of.**  
Corn Shells.  
Rumsey & Co., Seneca Falls, N. Y. 7

**Angers, Bits, etc., Manufacturers of.**  
The Gould Mfg. Co., Seneca Falls, N. Y. 7

**Angers, Bits, etc., Manufacturers of.**  
Corrugated Iron.  
Moseley Iron Bridge and Roof Co., 4 Dey, N. Y. 33

**Angers, Bits, etc., Manufacturers of.**  
Crucibles, Manufacturers of.  
Wile, Stedel & Co., 703 Market, Phila. 31

**Engines, Steam, Makers of.**

Ervin Chas. W. & Co., Kensington, Phila. 33

Fitchburg Steam Engine Co., Fitchburg, Mass. 34

Harris J. & Co., Providence, R. I. 34

Landis F. F. & A. B., Lancaster, Pa. 34

Lovetree & Co., Philadelphia, Pa. 35

Payne B. W. & Son, Philadelphia, Pa. 35

Payne & Wells, Binghamton, N. Y. 35

Wetherill Robt. & Co., Chester, Pa. 35

**Export Factors.**  
Jennings S. H., Deep River, Conn. 16

**Fan Blowers.**  
Landis Ezra F., Lancaster, Pa. 13

**Faucets, Brass, Makers of.**  
McNab & Harlin Mfg. Co., 45 John, N. Y. 24

**Faucets, Self-Measuring, Makers of.**  
Penfield Block Works, Lockport, N. Y. 33

**Faucets, Self-Measuring, Makers of.**  
Faucets, Mfg. Co., of Pa., Phila. and N. Y. 23

**Faucets, Self-Measuring, Makers of.**  
Lane Bros., Millbrook, N. Y. 3

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

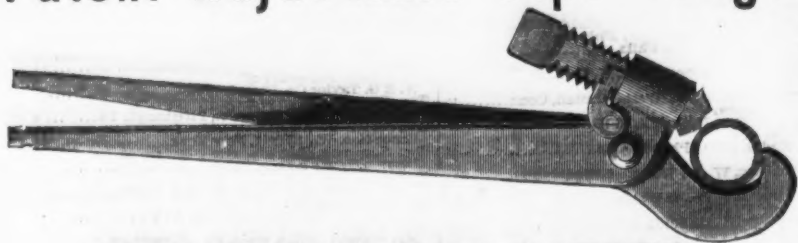
**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring, Makers of.**  
Faucet Works, 313 Cherry, Philadelphia. 4

**Faucets, Self-Measuring,**



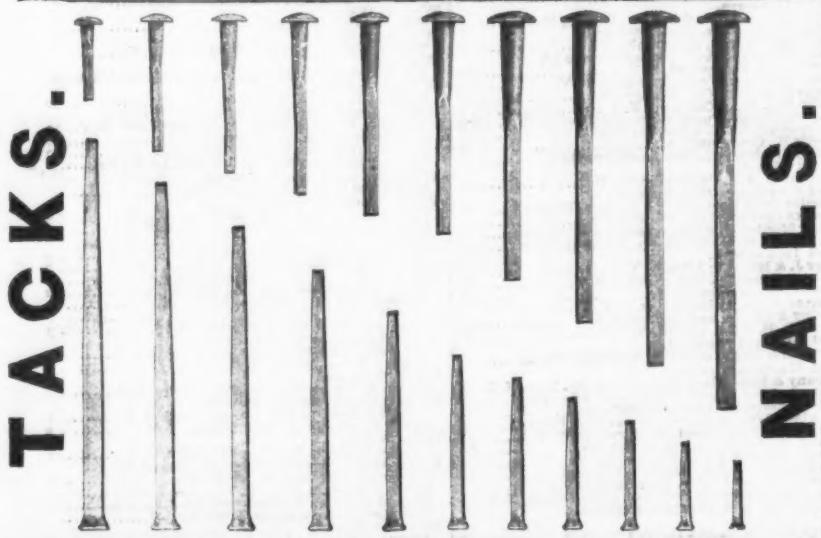
## JESSOP'S Patent Adjustable Pipe Tongs.



THE BEST IN THE MARKET.

Send for Samples.

**EATON, COLE & BURNHAM COMPANY,**  
Sole Manufacturers,  
58 John Street, New York.



## TACKS and SMALL NAILS Of Every Kind.

COPPER, ZINC, STEEL & SWEDES & COMMON IRON SHOE NAILS, &c.  
Copper, Iron and Galvanized Boat Nails,  
Regular or Chisel Pointed.

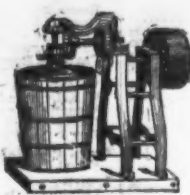
Brass & Iron Wire Nails, Moulding Nails and Escutcheon Pins, Chair & Cigar  
Box Nails, 2d & 3d Fine Nails, Roofing Tacks and Nails, &c., &c.  
MADE BY THE

**AMERICAN TACK CO., Fairhaven, Mass.**

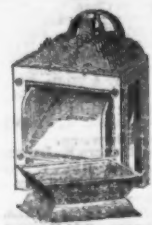
A full line of goods may be found at our  
NEW YORK SALESROOM, No. 117 Chambers Street.



HAND FREEZER.  
3 to 25 qts.  
\$2.50 to \$25.00



HAND OR POWER.  
25 and 50 qts.  
\$75.00 and \$175.00



HAND OR POWER  
ICE CRUSHER.  
\$75.00

**SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FREEZERS.**  
Galvanized iron outside, tin inside. No accretions of ice need be feared in the use of this Freezer. Simple in construction, perfect in results. Send for descriptive circular and discounts of this celebrated Freezer. Address  
**WHITE MOUNTAIN FREEZER CO., Laconia, N. H.**

## McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

## BRASS COCKS AND VALVES

For STEAM, WATER and GAS.

Iron Pipe and Fittings, Plain and Galvanized.  
**PLUMBERS' MATERIALS.**

New Illustrated Catalogue and Price List sent by express to the Trade on application.

Factory, Paterson, N. J.

56 John Street N. Y.

## REMINGTON'S

"REMINGTON'S"  
NEW LINE  
REVOLVERS.



Full Nickel Plated.

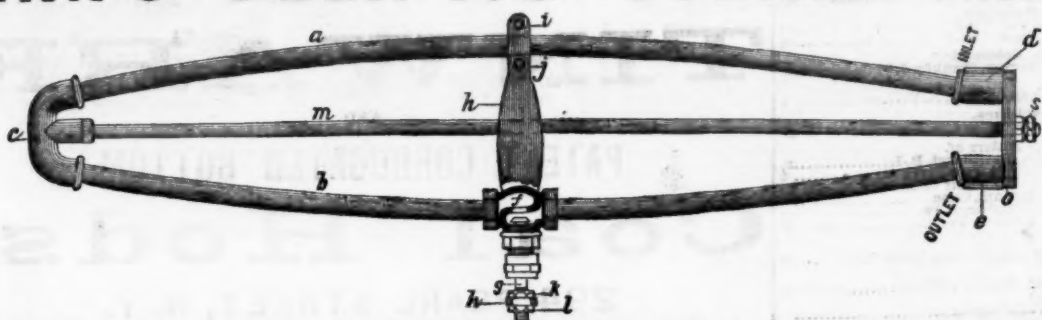
Checked Rubber Stocks.

\$2.50, 22 Cal. \$8.00, 38 Cal. \$9.00, 41 Cal.

\$8.00, 30 Cal. \$8.50, 32 Cal. \$9.00, 38 Cal. With ejectors.

Best in Market. Discount to dealers only. Cut this out and send for illustrated wholesale catalogue and price lists of Guns, Rifles, Pistols, Ammunition, &c., &c. Address  
**E. REMINGTON & SONS,**  
P. O. Box 3994. 283 Broadway, NEW YORK.

## BARR'S ELLIPTIC STEAM TRAP.



Has no floats or concealed parts to get out of order. Can be set to discharge water at any desired temperature. Once adjusted, never needs the slightest attention, being ABSOLUTELY AUTOMATIC in action. Never FREEZES in exposed situations, such as Rolling Mills, Hammer Shops, &c. Simplest in construction of any trap made. Has no reservoir in which to accumulate condensation, but discharges incessantly. Can be set in any position, either side or end up, without altering its working. Occupies less space, and being so light, can be used in situations where no other can. Send for Circular to manufacturers.

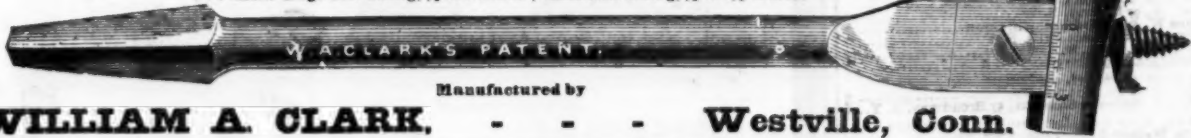
**PANCOAST & MAULE, 243 and 245 South Third St., Philadelphia.**

## HOLROYD & CO., Waterford, N. Y.



## CLARK'S PATENT EXPANSIVE BITS

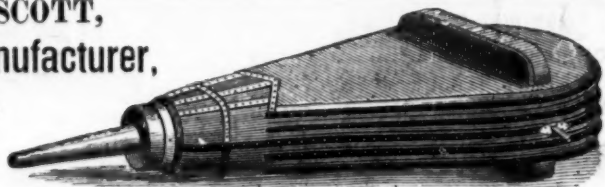
Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other  
Two sizes: Large Size Boring, 1/4 to 3 inches; Small Size Boring, 1/4 to 1 1/4 inches.



**WILLIAM A. CLARK, - - - Westville, Conn.**

**GEO. M. SCOTT,**  
Bellows Manufacturer,

Johnson Street,  
Cor. 22d St.,  
CHICAGO, ILL.



**H. PRENTISS & COMPANY,**

Sole Manufacturers of  
Goddard's Patent-Relieved Machinists' and Gasfitters' Taps. Solid Reamers,  
Screw Plates and Dies.



Dealers in Machinists' Supplies.

14 DEY STREET, New York.

## SPECIAL NOTICE.

The undersigned, in view of the Paris Exhibition of 1878, begs to inform his friends that he continues to make translations of Catalogues, Price-currents, Circulars, Correspondence, &c., from and into the

ENGLISH, FRENCH, GERMAN and SPANISH,

and that he bestows special attention upon a strictly correct rendering of Technical Expressions in matters relating to Machinery, Metallurgy, Hydraulics, &c. The very best reference will be furnished from leading manufacturers in this city, Philadelphia and elsewhere, for whom he has translated. If desired, estimates will be procured for the setting up, electrotyping and printing of catalogues, &c., in the above languages.  
**C. B. HICKMAN,**  
Metal Reporter of The Iron Age,  
53 Reade St., New York.

## Self-Measuring Oil Tank!

Patented Oct. 23d, 1877.



Economy, Convenience and Cleanliness  
Combined.

Send for circular.

**Kellogg & Johnson,**

Sole Manufacturers,  
ELMHURST, N. Y.

AGENTS.

JENNINGS & BENTLEY, 59 Jefferson Avenue, Detroit.

A. M. GILBERT & CO., 95 Lake Street, Chicago.

" " 157 Water Street, Cleveland.

" " 116 Main Street, Cincinnati.

STAR OIL COMPANY, 215 Michigan Street, Buffalo.

J. KENDALL, SON & CO., Winona, Minn.

McKIRGAN & CO., Newark, N. J.

**ANVIL & VISE COMBINED.**



No. 1, 10 1/2 x 4 in. face, 4 in. jaw Vise, weight 40 lbs. \$4.50  
No. 2, 8 x 3 1/2 in. face, 3 1/2 in. " " 25 " 3.75  
No. 3, 6 x 2 1/2 in. " " 25 in. " " 25 " 3.00  
This face of the Anvil is chill hardened. Terms cash.  
Delivered on cars at Worcester.  
**RICHARDSON MFG. CO., Worcester, Mass.**  
Liberal discount to the trade.

## COBB & DREW,

Plymouth, Mass.

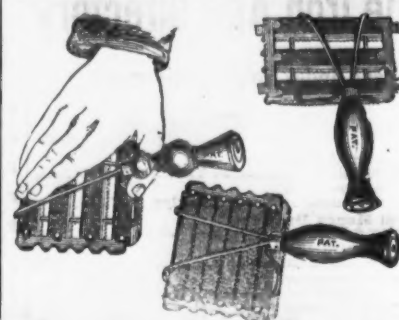
Manufacturers of Copper, Brass, and Iron Rivets; Copper and Swedes Iron, Leathered, Carpet, Lace and Glass Tacks; Finishing, Hanging, Trunk, Closet and Cigar Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

**George C. Grundy,**  
HARDWARE,  
165 Greenwich Street,  
Agents for the Philadelphia Star Carriage and Tire Bolts.

## 70 CHARCOAL.

BUSHELS OF CHARCOAL together with a net profit of  
per cord of wood, can be made by using  
**JEAN A. MATHIEU,**  
Address: JEAN A. MATHIEU,  
care Vailland, 15 S. Seventh Street,  
Room 2, PHILADELPHIA, PA.



## The Perfect Comb.

We call your attention specially to our new patent and wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a Perfect Comb. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly held, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: The Perfect Comb.

**THE LAWRENCE COMB CO.**

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

**WM. S. CARR & CO.**

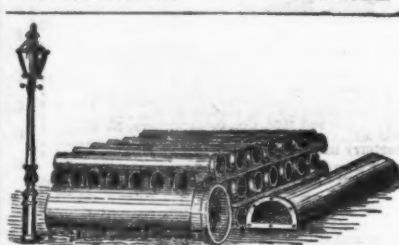
Sole Manufacturers of



**CARR'S**  
PATENT  
Water  
Closets,

PUMPS, CABINET WOOD WORK, &c.

106, 108 & 110 Centre Street,  
Factory, Mott Haven, NEW YORK.



**R. D. WOOD & CO.,**

Philadelphia,

Manufacturers of

## Cast Iron Pipe

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

## CORN SHELLERS

FOR

Home and Export Trade.

PRICES REDUCED ON ALL STYLES.

Before placing your orders send for illustrated lists with discounts.

**H. N. HUBBARD,**

MANUFACTORY,

No. 323 East Twenty-Second St., New York.



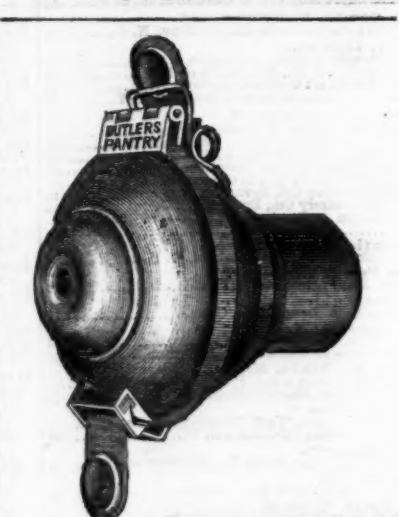
**WM. ESTERBROOK,**

Wholesale Manufacturer of

**Coal Hods**

**FIRE SHOVELS, Etc.,**

311 Cherry St., PHILADELPHIA.



**Porcelain, Nickel-Plated and Bronze Whistles.**

Plain or with indicators,

Speaking Pipe,

Bell Tubing,

Levers, Slides, &c.

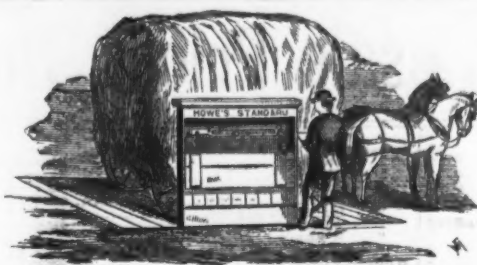
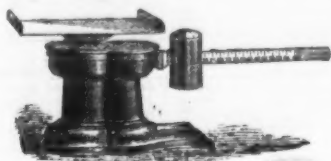
**FRANCIS MANY,**

143 Chambers St., New York.

BOILERS, ENGINES AND TANKS FOR SALE

at LESLIE BOILER WORKS, Pearl, near Greene St., Jersey City. Repairs promptly attended.





# THE IMPROVED HOWE SCALES.



PARIS,  
1878.



THEY WERE AWARDED

## THE GRAND GOLD MEDAL

And Several Special Medals of Gold, Silver and Bronze.

Took a Medal at Paris in every class in which they were exhibited.

ONLY SCALES SELECTED AT THE PARIS EXHIBITION FOR FRENCH NATIONAL MUSEUM.

MORE FIRST PRIZES IN 1878 THAN ANY OTHER SCALE.

The above Medals are FOR SCALES ONLY, no other goods having been shown in their exhibit.

At Baltimore the Maryland Institute awarded the Howe the Gold Medal. At Charleston the Agricultural Society of South Carolina awarded the "Howe Scales" the First Premium. Also at Kentucky, Minnesota, Missouri, Ohio, Wisconsin, Iowa and Maryland the "Howe" took the First Premium. The U. S. Government have for the third consecutive year awarded the "Howe Scale Co." the contract for Scales.

### CERTIFICATE

AT THE ST. LOUIS FAIR, OCTOBER 7th, 1878.

We, the undersigned, were a committee for the examination and comparison of Farm Implements, and we examined the Howe's Improved Scales and the Fairbanks' Scales, and found, in our opinion, the Howe Scales to be the best Scales, containing valuable improvements which add greatly to their durability, besides their being very simple, accurate and economical.

We therefore awarded the First Premium to the Howe Scales.

J. L. FERGUSON,  
FREDERICK H. TWELLMAN, } Judges.  
ROBT. M. JENNINGS.

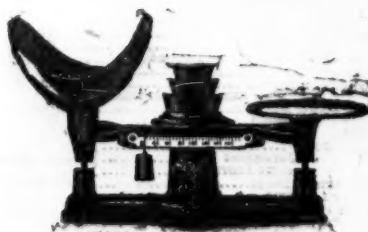
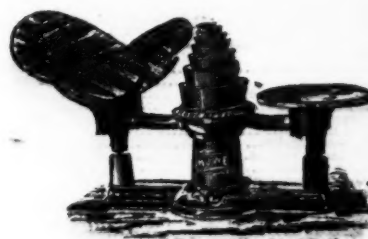
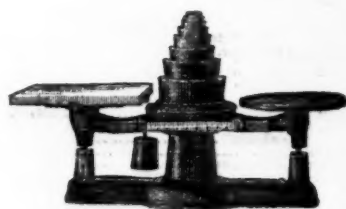
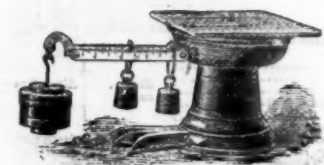
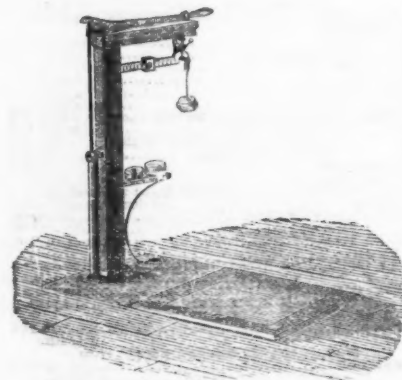
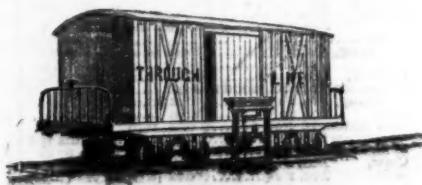
MADE BY THE

## HOWE SCALE CO.,

Rutland, Vermont.

### GENERAL AGENCIES:

PRIEST, PAGE & CO., 325 Broadway, New York,  
and Boston, Mass.; Philadelphia, Pa.; Pittsburgh, Pa.  
A. M. GILBERT & CO., Cincinnati, Ohio; Cleveland, Ohio; St. Louis, Mo.  
M. C. HAWLEY & CO., San Francisco, Cal.; Sacramento, Cal.; Portland, Oregon.  
H. GADBURY, Baltimore, Md.  
THOS. MCKENZIE & SONS, London and Dublin.  
J. F. DENNIS, European Manager, Bremen, Germany.





[illegible]



|  |        |
|--|--------|
| <b>Hardware.</b>                           |        |
| Boys' Patent                               | dis 25 |
| Stullman's Patent                          | dis 25 |
| Common Lever                               | dis 25 |
| Leach's                                    | dis 25 |
| Nash's                                     | dis 25 |
| Hammer                                     | dis 25 |
| Bentley & Co's New Pat. Lever              | dis 25 |
| Alken's Patent                             | dis 25 |
| Hart's Patent                              | dis 25 |
| Diston's                                   | dis 25 |
| <b>Scissors.</b>                           |        |
| Batch, Counter                             | dis 25 |
| Union Platform                             | dis 25 |
| Turnbull's Market                          | dis 25 |
| Palfrank's                                 | dis 25 |
| Howe's                                     | dis 25 |
| Chattillon's Grocers                       | dis 25 |
| Eureka                                     | dis 25 |
| Family Universal                           | dis 25 |
| Favorite                                   | dis 25 |
| Turnbull's                                 | dis 25 |
| Scale Beams, Chattillon's                  | dis 25 |
| Sargent's List                             | dis 25 |
| <b>Screw Drivers.</b>                      |        |
| Hart, Biron & Co's new list                | dis 25 |
| Douglas Mfg. Co's                          | dis 25 |
| Diston's                                   | dis 25 |
| Buck Bros.                                 | dis 25 |
| Stanley Rule & Level Co's Black Handlrs    | dis 25 |
| Sargent & Co's                             | dis 25 |
| <b>Screws.</b>                             |        |
| Flat Head Iron                             | dis 25 |
| Round Head Iron                            | dis 25 |
| Flat Head Brass                            | dis 25 |
| Round Head Brass                           | dis 25 |
| Brass and Silver Caped                     | dis 25 |
| Japanese List of Plain Screws              | dis 25 |
| Lag or Common                              | dis 25 |
| Coch Patented (Milled Point)               | dis 25 |
| Bed  | dis 25 |
| Machine, Flat Head, Iron, Am. Screw Co.    | dis 25 |
| " Round Head, Iron, Am. Screw Co.          | dis 25 |
| Bench, Iron                                | dis 25 |
| " Wood, Bench                              | dis 25 |
| Hand                                       | dis 25 |
| Hand Rail, Sargent's                       | dis 25 |
| Hickory                                    | dis 25 |
| Jack Bell Bottom                           | dis 25 |
| Jack (Wilson)                              | dis 25 |
| Sash & S. Mfg. Co's                        | dis 25 |
| <b>Shears and Scissors.</b>                |        |
| Cut Steel                                  | dis 25 |
| Iron, American                             | dis 25 |
| Seymour's Straight Trimmer                 | dis 25 |
| Pruning                                    | dis 25 |
| Harvard's List of Pruning Hooks and Shears | dis 25 |
| Timmer's                                   | dis 25 |
| Helmich Trimmers and Scissors              | dis 25 |
| R. H. S.                                   | dis 25 |
| <b>Shovels.</b>                            |        |
| Sliding Door, M. W. & Co, list             | dis 25 |
| " R. & E. list                             | dis 25 |
| " Russell's                                | dis 25 |
| " Moore's Anti-Friction                    | dis 25 |
| Sliding Shutter, R. & E. list              | dis 25 |
| Moore's Anti-Friction                      | dis 25 |
| Philadelphia, Hanging                      | dis 25 |
| <b>Shovels and Spades.</b>                 |        |
| " not stamped "Ames"                       | dis 25 |
| Kimball Shovel Co.                         | dis 25 |
| Old Colony                                 | dis 25 |
| Remington's (Lowman's Patent)              | dis 25 |
| Dunning's Shovels and Scoops               | dis 25 |
| Rowland's " Regular new list               | dis 25 |
| " Patent, new list                         | dis 25 |
| Oxford Patent, new list                    | dis 25 |
| <b>Shovels and Tongs.</b>                  |        |
| Iron and Brass                             | dis 25 |
| Polished Steel                             | dis 25 |
| Square Frames, Round Corners, by case      | dis 25 |
| Spoke Shavers                              | dis 25 |
| Defiance Metallic                          | dis 25 |
| Wood                                       | dis 25 |
| Bailey's                                   | dis 25 |
| <b>Spoke Trimmers.</b>                     |        |
| Bonney's                                   | dis 25 |
| Stearns                                    | dis 25 |
| Iron                                       | dis 25 |
| Douglas                                    | dis 25 |
| <b>Spoons.</b>                             |        |
| Timed Iron                                 | dis 25 |
| Basting                                    | dis 25 |
| Britannia                                  | dis 25 |
| Perby Silver Co's                          | dis 25 |
| L. Boardman's Sons, A1                     | dis 25 |
| Rogers & Bro. A.1                          | dis 25 |
| Need & Barton                              | dis 25 |
| Hall & Elton                               | dis 25 |
| Holmes, Booth & Haydens                    | dis 25 |
| German Silver                              | dis 25 |
| Diamond Steel (L. Boardman's Sons)         | dis 25 |
| Tin (P. & W.), Teas                        | dis 25 |
| Tin Cows (H. W. Co.)                       | dis 25 |
| Case lots                                  | dis 25 |
| <b>Stocks and Dies.</b>                    |        |
| " Lightning " Screw Plate                  | dis 25 |
| <b>Stone.</b>                              |        |
| Hindostan Stone                            | dis 25 |
| " Slips                                    | dis 25 |
| Sand Stone                                 | dis 25 |
| Washita Stone                              | dis 25 |
| " Slips                                    | dis 25 |
| Arkansas Stone                             | dis 25 |
| " Slips                                    | dis 25 |
| Turkey Oil Stone (Boyd & Chase)            | dis 25 |
| " Slips                                    | dis 25 |
| Lake Superior (Boyd & Chase)               | dis 25 |
| " Slips                                    | dis 25 |
| Grindstones, Family, Loring's              | dis 25 |
| <b>Stove Polish.</b>                       |        |
| Joseph Dixon's                             | dis 25 |
| Gem  | dis 25 |
| Gold Medal                                 | dis 25 |
| " Mirror                                   | dis 25 |
| Ruby                                       | dis 25 |
| Rising Sun                                 | dis 25 |
| <b>Squares.</b>                            |        |
| Steel                                      | dis 25 |
| Iron                                       | dis 25 |
| Nickel Plated                              | dis 25 |
| Try Squares and Bevels                     | dis 25 |
| Star Try Squares and Bevels                | dis 25 |
| Diston's Try Squares and Bevels            | dis 25 |
| Winterbottom's Try Squares and Bevels      | dis 25 |
| Bailey's Try Squares and Bevels            | dis 25 |
| <b>Trucks, Brads, &amp;c.</b>              |        |
| Shoe Nails, new list                       | dis 25 |
| Double-Pointed Tracks                      | dis 25 |
| <b>Tap Bore.</b>                           |        |
| Common and Ring                            | dis 25 |
| Live Tap Bore                              | dis 25 |
| Enterprise Mfg. Co.                        | dis 25 |
| <b>Tapes, Measuring.</b>                   |        |
| American                                   | dis 25 |
| Spring Tapes                               | dis 25 |
| Thermometer                                | dis 25 |
| Tin Case                                   | dis 25 |
| Enterprise Mfg. Co. (Champion)             | dis 25 |
| Wood Bottom                                | dis 25 |
| All Iron                                   | dis 25 |
| Nashua Lock Co's                           | dis 25 |
| Tea Calks - Winsted                        | dis 25 |
| Turners' Tools and Machines                | dis 25 |
| Machines (P. & W. Co.)                     | dis 25 |
| Tools (P. & W. Co.)                        | dis 25 |
| <b>Traps.</b>                              |        |
| Game, Newhouse                             | dis 25 |
| Newhouse Patent                            | dis 25 |
| Blake's Patent                             | dis 25 |
| Mouse, Wood, Choker                        | dis 25 |
| " Patent                                   | dis 25 |
| " Round Wire                               | dis 25 |
| " Cage                                     | dis 25 |
| " Patent Self Setting                      | dis 25 |
| " Catch-em-alive                           | dis 25 |
| " Decoy                                    | dis 25 |
| <b>Trowels.</b>                            |        |
| Lothgros Brick and Plastering              | dis 25 |
| Need's Brick and Plastering                | dis 25 |
| Pence's Plastering                         | dis 25 |
| Clément & Maynard                          | dis 25 |
| Rose's Brick                               | dis 25 |
| Bradley's Brick                            | dis 25 |
| Worrall's Brick and Plastering             | dis 25 |
| Garden                                     | dis 25 |
| <b>Triers.</b>                             |        |
| Butter and Cheese                          | dis 25 |
| <b>Vices.</b>                              |        |
| Solid Box, Trenton - New List, Nov. 19, 78 | dis 25 |
| " Wilsons - New List, Nov. 19, 78          | dis 25 |
| " Crown " (A. H. Hildicks) 4 to 100 lbs.   | dis 25 |
| " Peter Wrights                            | dis 25 |
| Parahol, Parkers                           | dis 25 |
| Wilson's                                   | dis 25 |
| " Howard's                                 | dis 25 |
| Merrill's                                  | dis 25 |
| Sargent's                                  | dis 25 |
| Trenton                                    | dis 25 |
| Backus and Union                           | dis 25 |
| Fisher & Co's                              | dis 25 |
| Stevens                                    | dis 25 |
| Simpson's Adjustable                       | dis 25 |
| " Family " List                            | dis 25 |
| New Files, Bonney's                        | dis 25 |
| Stearns                                    | dis 25 |
| Hopkins                                    | dis 25 |
| Lorain Hand Saw                            | dis 25 |
| Hand Saw and Nail                          | dis 25 |

|  |  |        |
|--|--|--------|
| <b>Ventilators.</b>                      |  |        |
| Protective (upper) per foot, \$1.00..... |  | dis 25 |
|  |  |        |



Steel.

# R. H. WOLFF & CO.,

IMPORTERS OF  
**IRON AND STEEL.**

Sole Agents for the Sale of the Celebrated  
**Pr. HOMOGENEOUS DEC. CAST STEEL, GUN BARRELS, MOULDS AND ORDNANCE.**  
Sole Agents for **COCKER BROTHERS, Limited,**  
Successors to **SAML. COCKER & SON, (ESTABLISHED 1752.)**  
**SHEFFIELD, ENGLAND.**

Sole manufacturers of  
**'EXTRA' Cast Steel,**  
AND  
**CAST STEEL WIRE** for all purposes.  
Sole Makers of

**Cocker's "Meteor" Wire Plates.**  
Railroad Supplies and General Merchants.  
Office and Warehouse, 46 Cliff Street, New York.

## F. W. MOSS,

Successor to **JOSHUA MOSS & GAMBLE BROS.**  
**FRANKLIN WORKS, WALKER WORKS, SHEFFIELD, ENGLAND.**  
**STEEL AND FILES.**

Principal Depot, 80 John Street, New York.  
**MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,**  
Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.  
**WARRANTED CAST STEEL,** especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.  
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools.  
Warranted not to crack in hardening Taps of any size.  
Swede Spring Steel, especially adapted for Locomotive and Railway Car Springs.  
English Spring and Flaw Plate Steel.  
Sheet, Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel.  
**GENERAL MERCHANT.**

## CRESCENT STEEL WORKS

**MILLER, METCALF & PARKIN,**  
Pittsburgh, Pa.,

Manufacture the Favorite Brands of  
**Crescent, Crescent Extra, Crescent Special TOOL STEEL.**

Polished, Compressed Drill Rods and Wire,  
Warranted equal to any imported in quality, finish and accuracy.  
Bright Cold Rolled Strips to No. 36, Fine Hot Rolled Sheets to No. 30.

Cast, Spring and Machinery Steel. Common Steel, all grades.  
OFFICES: 81 Wood St., Pittsburgh; 40 Dearborn St., Chicago; 720 N. 2d St., St. Louis.  
REPRESENTED IN THE MIDDLE STATES AND NEW ENGLAND BY  
**ELY & WILLIAMS,** 1232 Market Street, Philadelphia.  
114 John Street, New York.

## J. & RILEY CARR,

Manufacturers of the "Celebrated"  
**"DOG BRAND" FILES.**  
Also of Superior  
**STEEL**  
For Drills, Cold Chisels, Tools, Taps, Dies, &c.  
**COLD ROLLED STEEL** for Clock Springs, Corsets, &c.  
**SHEET CAST STEEL** for Springs, Saws, Welding Cold, &c.  
GERMAN, MACHINERY, ENGLISH AND SWEDISH SPRING STEEL,  
And all other descriptions for machinists and agricultural purposes.  
Warehouse, 30 Gold Street, New York.  
Near John Street. **HENRY MOORE, Agent.**

## FRANCIS HOBSON & SON,

97 John Street, NEW YORK,  
Sole Manufact'rs of **"CHOICE" Extra Cast Steel.**  
Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.  
Don Works, Sheffield, England.  
**CHAS. HUGILL, Agent.**

## S. & C. WARDLOW,

Sheffield, England,  
Manufacturers of the Celebrated  
**Cast and Double Shear STEEL.**

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives,  
Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.  
Warehouse, 95 John Street, New York.  
**WILLIAM BROWN, Representative.**

Steel.

# SANDERSON BROTHERS & COMPY'S

## BEST REFINED CAST STEEL.

Warranted most superior for TOOLS AND GRANITE ROCK DRILLS.  
A full assortment of this universally approved OLD BRAND and other Steels for sale by

## FRITH & TILESTON, Agents,

EDWARD FRITH, No. 16 Cliff Street, NEW YORK.  
WM. TILESTON.

LABELLE STEEL WORKS.

# SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF  
**STEEL.**

Also Springs, Axles, Rake Teeth, &c.  
OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.  
Post Office Address, Pittsburgh, Pa.  
Represented at Boston by WETHERELL BROS., 21 Oliver St.; at Milwaukee by JOHN PRITELAFF, 43 to 45 West Water St.; at Chicago by S. D. KIRKMAN, 86 to 88 Michigan Ave.

## ALBANY & RENSSELAER IRON & STEEL CO.,

Troy, N. Y.,

Office in New York City, 56 BROADWAY.  
MANUFACTURERS OF  
**Bessemer Railway Steel,**  
MERCHANT BARS, TIRE AND SHAFTING,  
Railroad Iron, Pig Iron, Merchant and Ship Iron,  
AGENCIES IN BOSTON AND PHILADELPHIA.

## Mica and Porcelain Materials.

# THE CHESTER MICA AND PORCELAIN CO.

OFFER

Mica of the Best Quality,  
Feldspar of highest Standard and Purity,  
Quartz, the Finest, Whitest, Best.  
Kaolin, Asbestos and Baryta.  
Best Terms, Wholesale and Retail.  
Address, CHESTER MICA AND PORCELAIN CO., 87 Liberty St. New York.



**HOC RINGER**  
RINGS and HOLDER.  
Only double Ringer ever invented. The only Ringer that will effectually root out all sharp points in the nose.



**EAGLE BILL CORN HUSKER**  
Is the best Husker in the market. Farmers say it is the best. Use no other.



**BROWN'S HOC AND PIG RINGER**  
RINGS and RINGS.  
Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.

Holders, 75c. Rings, 50c. 100. Holders, 75c. Huskers, 15c.  
**CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.**



## THE SWIFT MILL.

ESTABLISHED 1845.  
The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.  
ALSO LANE'S PORTABLE COFFEE ROASTER  
Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.  
**LANE BROS., Millbrook, N. Y.**  
Also sold by leading wholesale houses.  
Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at Factory prices.



## THE IRONMONGER

The Ironmonger & Metal Trades' Advertiser.  
A WEEKLY TRADE JOURNAL.  
PUBLISHED EVERY SATURDAY, AT 446 CANNON STREET, LONDON, E. C.,  
And issued in 53 Numbers, one in the form of a handsome Diary and Text Book, adapted to the Ironmongery and Metal Trades.

"THE IRONMONGER" was established in 1859, and is the oldest and chief representative organ of the Iron, Hardware and Metal Trades. This journal stands pre-eminent amongst trade publications, and possesses all the advantages of the Commercial Newspaper and a high-class Literary Magazine. The principal characteristics of "THE IRONMONGER" are the accuracy of its Market Reports and Prices Current; the intrinsic value of its Home, Foreign and Colonial Correspondence; the impartiality of its criticism upon the leading novelties of the day; its careful selection of Agricultural, Legal and Magisterial News appertaining to the Metal Trades; the completeness of its list of Patents and General Statistics, and its multiplicity of classified advertisements. The main object of this publication is to furnish a faithful record of all things of specific value to those interested in the manufacture, purchase, consignment, shipment or sale of Hardware, Arms and Ammunition, Oils, Seeds, Implements, Machinery and Metals.

The Foreign Supplement is published every fourth Saturday, in English, French, German, Spanish and Italian, giving a selection of suitable news and advertisements. Full terms on application to the office in London.  
**GREAT BRITAIN, IRELAND, Australasia, Belgium, Brazil, Canada, Cape of Good Hope, China, France, Germany, Greece, India, Italy, River Plate, Russia, Spain, the West Indies, and United States of America**  
are the principal places where *The Ironmonger* is circulated, amongst Ironmongers, Merchant Shippers, Foreign and Colonial Store Dealers, Factors, Mechanical and Mining Engineers, and the Users of Steam Power and Engineering Plant.  
This class of persons constitutes the majority of the subscribers to *The Ironmonger*, and the value of this publication as an influential advertising medium cannot, therefore, be overrated.  
Subscription, 20s. per year, payable in advance; commencing from any date.  
Post free to every country in the world.  
American subscribers can reach it by a year's subscription, either direct to the London Office, or through the publisher of *The Iron Age*, 6, Beady Street, New York.

Steel.

# R. MUSHET'S

## Special Steel

FOR  
**LATHES, PLANERS, &c.**

Turns out at least double work by increased speed and feed, and cuts harder metals than any other Steel. Neither hardening nor tempering required.  
Sole Makers  
**SAMUEL OSBORN & CO.,**  
Sheffield, England.  
Represented by  
**RANDALL & JONES,** 10 Oliver St., Boston.  
BRANCH, CROOKES & CO., Vine Street, St. Louis, Mo.

## STEELINE.

Used for refining and tempering all kinds of Steel Tools.  
Increases their Durability at least five fold.  
Secures absolute safety from cracking.  
Send for circular to  
**BAUER & CO., 96 Greenwich Av., N. Y.**

## Gunpowder.

# GUNPOWDER.

## DUPONT'S

Rifle, Sporting and Blasting Powder  
The most popular Powder in use.

Dupont's Gunpowder Mills, established in 1801, have maintained their great reputation for 78 years. Manufacture the following celebrated brands of Powder:  
**DUPONT'S DIAMOND GRAIN,**  
Nos. 1 (coarse) to 4 (fine), unequaled in strength, quickness and cleanliness; adapted for Glass Ball and Pigeon Shooting.  
**DUPONT'S EAGLE DUCKING,**  
Nos. 1 (coarse) to 3 (fine), burning slowly, strong and clean; great penetration; adapted for Glass Ball, Pigeon, Duck and other shooting.  
**DUPONT'S EAGLE RIFLE,**  
A quick, strong, clean Powder of very fine grain for Pistol shooting.  
**DUPONT'S RIFLE, Fg. "Sea Shooting,"**  
FFg and FFFg.—The Fg for long range rifle shooting, the FFg and FFFg for general use, burning strong and moist.  
Also all kinds of Sporting, Mining, Shipping and Blasting Powders of all sizes and descriptions. Special grades for experts. Also, Musket, Cannon, Mortar and Mammoth Powder, U. S. Government standard. Powder manufactured to order of any required grain or proof. Agencies in all cities and principal towns throughout the U. S. Represented by  
**F. L. KNEELAND, 70 Wall St., N. Y.**  
N. B.—Use now but Dupont's Fg or FFg Powder for long-range Rifle shooting.

## CUN POWDER.

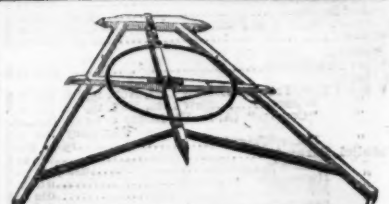
# Lafin & Rand Powder Co.

No. 26 Murray Street, New York,  
Manufacture and sell the following celebrated brands of Sporting Powder known everywhere as  
**ORANGE LIGHTNING,**  
**ORANGE DUCKING,**  
**ORANGE RIFLE**  
more popular than any Powder now in use.  
Blasting Powder and Electrical Blasting Apparatus.  
Military Powder on hand and made to order.  
**SAFETY FUSE, FRICTIONAL & PLATINUM FUSES.**  
Pamphlets showing sizes of grain sent free.

Torrey's Door Springs.  
**P. R. DUNNE,**  
Manufacturer,  
 182 Fulton St.,  
NEW YORK.

Established 1838.  
**Bevin Bros. Mfg. Co.,**  
Easthampton, Ot.  
Manufacturers of  
**SLEIGH BELLS.**  
House, Tea, Hand, Gong Bell &c.  
Bell Metal Kettles.

  
**R. BLISS MFG. CO.,**  
Manufacturers of Hand and Bench Saws, Cabinet and Piano-Forte Makers' Clamps, Chisel Handles, Carpenters' Mallets, Croquet Games, Tourists, Boys' Tool Chests, Architectural Building Blocks, Toys, &c.  
Pawtucket, R. I.

  
The large gains which have attended the introduction of this Gearing warrant the manufacturers in again calling the attention of the Hardware Trade to it. It is the best article of the kind in market, and sells at sight. Having special rates of freight we are prepared to deliver anywhere in the United States at panic prices.  
Address sole manufacturers,  
**ROME TRESTLE CO., Limited, Rome, N. Y.**



## Steel.

## JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,  
BUTCHERS' STEELS,  
AND  
SHOE KNIVES.THE TRADE MARK, IN ADDITION  
TO THE NAME,  
IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY  
**JOHN WILSON.**GRANTED A.D. 1786, BY THE  
INCORPORATION OF CUTLERS OF SHEFFIELD,  
AND PROTECTED BY ACT OF PARLIAMENT.BUYERS ARE SPECIALLY CAUTIONED AGAINST  
IMITATIONS OF THE MARK, AND THE  
SUBSTITUTION OF COUNTERFEITS  
BEARING THE NAME, "WILSON," ONLY.

Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750

## North Chicago Rolling Mill Co.

ESTABLISHED 1857.

CAPITAL, \$3,000,000.

INCORPORATED 1869.

Works at Chicago, Ill., and Milwaukee, Wis.

MANUFACTURERS OF

MERCHANT BAR, FISH PLATES, PIG METAL,  
IRON RAILS & BESSEMER STEEL RAILS.

|                              |              |
|------------------------------|--------------|
| Capacity of Works:           |              |
| Fish Plates.....             | 30,000 tons. |
| Merchant Bar.....            | 40,000 "     |
| Pig Metal.....               | 80,000 "     |
| Iron Rails.....              | 80,000 "     |
| Steel Rails.....             | 50,000 "     |
| Total Capacity per year..... | 260,000 "    |

OFFICES:

17 Metropolitan Block, Chicago, Ill.  
37 Mitchell Block, Milwaukee, Wis.O. W. POTTER, President, CHICAGO.  
S. P. BURT, Vice-President, NEW BEDFORD.  
S. CLEMENS, Treasurer, MILWAUKEE.  
R. C. HANNAH, Secretary, CHICAGO.

## HERMANN BOKER &amp; CO.,

OFFICES AND WAREHOUSES:

NEW YORK, 101 and 103 Duane St. and 91 and 93 Thomas Streets.

REMSCHIED and SOLINGEN (Prussia.) H. BOKER &amp; CO.

SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. ARTHUR LEE.

LIEGE (Belgium), Represented by Mr. LOUIS MÜLLER.

Manufacturers and Importers of Cutlery, Guns, Hardware and Railroad Material.

Proprietors of TRENTON VISE AND TOOL WORKS, Trenton, N. J.—Vices, Picks

Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.

Proprietors of the MANHATTAN CUTLERY CO., "O. K." Razors.

LAMSON &amp; GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cutlery and Butcher

Knives.

Sole Agents for H. HEINISCH SONS' CELEBRATED TAILORS' SHEARS, TRIM-

MERS, SCISSORS, &amp;c., both Japanese and Nickel-Plated.

Gardner's Pocket Knives. Trenton Anvils.

We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material,  
Chains, Heavy Goods.WM. H. HASKELL & CO.  
Pawtucket, R. I.,

MANUFACTURERS OF

## COACH SCREWS

(With Gimlet Points),

ALL KINDS OF

Machine and Plow Bolts,  
FORGED SET SCREWS,AND  
TAP BOLTS.

Simple, Strong, and Cheap in

Price.

Thorough in its Working.

APPROVALS.

We have no hesitation in recom-  
mending it in the highest  
terms.  
MACOMBER, BOWEN & DOWSE,  
Wholesale Hardware Dealers.  
It far exceeds any machine for  
the purpose which has come un-  
der my observation since 1845 (an experience of over  
30 years).  
House Furnisher, 41 West St., Boston.It proved to be one of the best labor-saving ma-  
chines that I know of, for the amount it cost.  
S. A. BAILEY, Treas. Bailey Wringing Mch. Co.  
Prices per doz., \$24, \$27, \$33, with good pans.  
Send for descriptive circular and terms.

Patented March 19, 1876.

STANYAN COMPANY, Sole Mfrs., 75 High St., Boston, Mass.

## KEYSTONE

## Portable Forges.

Several sizes and so styles, for every purpose from the  
lightest to the heaviest work. Also

PRESSURE BLOWERS

AND

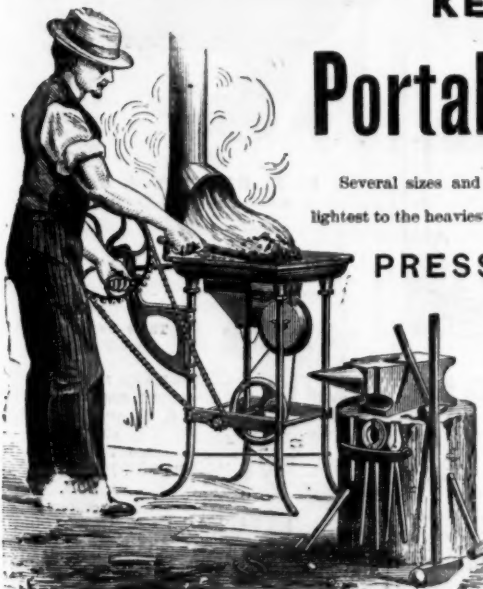
EXHAUSTERS

Sizes from six inches to six feet.

Send for catalogue.

K. P. F. Co.,

218 Carter St., Philadelphia.



## HERMANN BOKER &amp; CO.,

101 and 103 Duane St., New York,

SOLE AGENTS FOR

Peugeot Brothers'

Patent Improved

## HORSE CLIPPERS.

The cutting parts are made of the very best English Cast Steel. The  
upper knife passes over two teeth. There is a protecting plate which  
gives the Clipper great strength. The iron parts of the handles are all  
wrought, not malleable, iron, and adjusted so that there is no danger  
of the handles getting broken. Every Clipper is carefully examined be-  
fore leaving the factory. Quick and easy working can be guaranteed.

## The Latest Novelty.

## OUR TOY SCALE, TO PLAY STORE WITH.

Pleases the Children and sells on sight. Price \$4 per doz., net.  
Special Prices in Gross Lots.SOUTHWARK HARDWARE CO., S. E. Cor. Second St. and Washington Ave.,  
PHILADELPHIA, PENN.Manufacturers of Three Grades of Counter Scales.  
Equal to the best and lower in price. Send for Illustrated Catalogue.

## STANDARD NUT CO.,

Pittsburgh, Pa.,

MANUFACTURERS OF

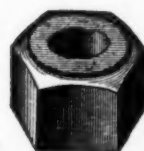
HOT PRESSED  
Square & Hexagon Nuts,

R. R. FISH BARS,

BOLTS,

SPIKES,

RIVETS, &amp;c.

Wheeler, Madden & Clemson  
MFG. CO.,

MIDDLETOWN, - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

## SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,  
WOOD SAWS, Etc., Etc.

## Harvey W. Peace, Vulcan Saw Works.

Manufacturer of every kind of

Patent Ground  
SAWS.Circulars, Cross-Cuts, Mill  
Saws, Gang, Hand,  
and Butcher.Molding and Planing Knives  
Plastering Trowels, Miter-  
ing Rods, &c.

Union Avenue, Tenth and Alameda Streets, BROOKLYN, E. D., N. Y.

## AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,  
PERFORATED CROSS-CUT SAWS  
And SOLID SAWS of all kinds. Trenton, N. J.

## Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

938 to 954 River St. &amp; 67 to 83 Vail Ave., Troy, N. Y.,

## VALVES.

Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Inlet, Outlet, &c.  
for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

## Emerg. Grindstones, &amp;c.

Walter R. Wood,  
GRINDSTONES.Berea, O., Nova Scotia, & other brands  
283 and 285 Front Street, New York.

## WORTHINGTON &amp; SONS.

North Amherst, Ohio.

Manufacturers of

Lake Huron Amherst  
and Berea

## GRINDSTONES.

## H. S. WOOD &amp; CO.,

Manufacturers of  
Berea, O.  
Black River, O.  
Lake Huron, Mich.Importers of  
New Castle, Eng.  
Wickersley, Eng.  
Nova Scotia.

## GRINDSTONES,

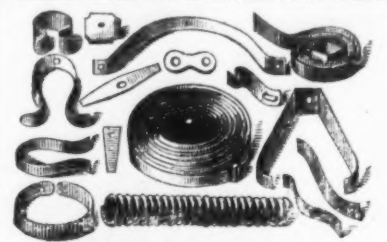
33 West and 58 Washington Sts., N. Y.

## BOYD &amp; CHASE,

The largest manufacturers in the world of

## OIL STONE

Of all description.

107th Street and Harlem River,  
Send for Illustrated Price List. NEW YORK.

## DUNBAR BROS.,

Manufacturers of

Clock Springs and Small Springs

of every description, from best Cast Steel,  
BRISTOL, CONN.DR. HALE'S  
CHAMPION  
STEAM COOKEREvery variety of Meats,  
Vegetables, Puddings,  
Rice, Hominy, etc.,  
cooked by steam  
Without Mingleing the  
Flavors.Used on any STOVE,  
RANGE or FURNACE.  
Emits no offensive odor,  
and cannot possibly  
burn the food. SAVES  
TIME, LABOR AND  
FUEL. Every lady who  
tries it is enthusiastic in  
praising it.RELIABLE AGENTS  
wanted in every town  
in the country. Town,  
County and State rights  
may be obtained and  
agencies secured by ap-  
plying toDR. HALE,  
No. 51 Washington Street,  
BOSTON.Ten Pins and Balls constantly on hand. Lignum-  
vite for sale by the ton or pound. All orders large or  
small promptly attended to at shortest notice.  
Can refer to leading consumers and dealers at New  
York and vicinity.

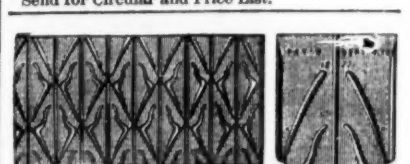
## JOHN ADT,

20, 22, 24 and 26 Artisan St., New Haven, Ct., U. S. A.

## Automatic Machines

For Straightening and Cutting Wire of  
all Sizes to any Length.Automatic Machines for cutting and forming  
wire in various shapes. Send for circulars.

## BRASS TUBES.

Fine Mandrel Drawn Tubes, of all sizes and  
thickness, manufactured byROBT. T. DEAKIN & CO.,  
500 North 12th St., Philadelphia.N. B.—Tubes for sliding one within the other  
made to order.  
Send for Circular and Price List.METALLIC  
SHINGLES.We call the attention of all parties  
interested in Roofing, and the  
owners of large buildings, to the  
above article. It is superior to  
slate, cheaper, fire proof, about one-fourth the weight,  
lays much closer, therefore is storm proof, cannot  
crack, &c. Any carpenter can put them on. Send for  
description and Price List to Iron Clad Manu-  
facturing Co., 51 Greenpoint Av., Brooklyn, E. D.  
P. O. Box, 254, N. Y. City.

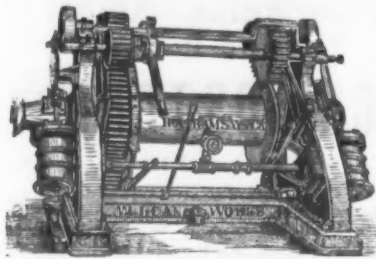


**RIEHLE BROS.**

Office and Works, 9th St., above Master, Phila.  
Warehouses, 42 & 43 1/2 St., above Chestnut, Phila.  
New York Store, 91 Liberty Street.

# STANDARD Scales AND TESTING MACHINES

\* Patented \* Furnace Charging Scale.  
Double Beam R. R. Track Scale, Compound Parallel  
Crane Beams, &c., Patented First Power Lever Wagon  
Scales. Testing Machines any capacity.  
Send for Illustrated Price List.



The "Ramsay Improved Steam Winder,"  
Manufactured by H. A. RAMSAY & CO.,  
Vulcan Iron Works, Baltimore, Md.



TRADE MARK.  
**The Atlantic White Lead and Linseed Oil Co.,**  
MANUFACTURERS OF  
White Lead (Atlantic), Red Lead,  
Litharge & Linseed Oil.  
**ROBERT COLGATE & CO.,**  
287 Pearl Street, New York.

**John T. Lewis & Bros.,**  
No. 231 South Front St.,  
PHILADELPHIA.



TRADE MARK.  
MANUFACTURERS OF  
Pure White Lead, Red Lead, Litharge,  
Orange Mineral, Linseed Oil,  
AND PAINTERS' COLORS.

**JOHN JEWETT & SONS,**  
Manufacturers of the well-known brand of  
**WHITE LEAD.**



TRADE MARK.  
ALSO MANUFACTURERS OF  
**LINSEED OIL.**  
182 Front Street, NEW YORK

**Brooklyn White Lead Co.**



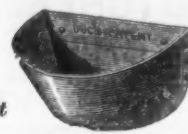
TRADE MARK.  
**White Lead, Red Lead & Litharge.**  
89 Maiden Lane, NEW YORK.  
FISHER HOWE, TREASURER.

# DUK'S IMPROVED ELEVATOR BUCKET.



THE STORE-HOUSE BUCKET.  
(Partial straight front.)  
In 12 in., 14 in., 16 in. and 17 in. Sizes.

Made of Best Charcoal Stamping Iron.  
**No Corners to Catch.**  
Light Running and Very Durable.  
The only Scientifically Constructed Elevator Bucket  
in the Market.



THE  
MILL BUCKET.  
In 3 1/2 in. to 10 in.  
Sizes.

**T. F. ROWLAND,**

Sole Manufacturer,

**CONTINENTAL WORKS, Brooklyn, E. D., N. Y.**

Send for Circular.

# NICHOLSON FILE CO.,

Manufacturers of

# FILES AND RASPS.

ALSO

# Filers' Tools & Specialties.

Manufactory and Offices at Providence, R. I.

The following space will be used in illustrating our specialties, the matter being changed weekly.

# INTERNATIONAL EXHIBITION. PHILADELPHIA, 1876.



The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.



PHILADELPHIA, May 4th, 1877.

# REPORT ON AWARDS.

Product, *Files and Rasps.*

Name and Address of Exhibitor, *Nicholson File Company,*  
*Providence, Rhode Island.*

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award for the following reasons, viz:

*Being exceedingly well cut and of excellent material.*

*Daniel Steinmetz, of Pha.*  
Signature of the Judge.

# APPROVAL OF GROUP JUDGES.

J. D. Imboden, of Richmond, Va.  
Chas. Staples, Jr., "Portland, Me.  
G. L. Reed, "Clearfield, Pa.  
J. Dieffenbach, "Germany.  
David McHardy, "Great Britain.

A true Copy of the record.

*Francis A. Walker,*  
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

*A. T. Goshorn,*  
Director General.

*J. R. Hawley,*  
President.



*J. L. Campbell,*  
Secretary.

# MANUFACTURERS' SUPPLIES.

The Best and Lowest Price.

**H. A. ROGERS, 19 John Street, New York.**

A few doors from Broadway.

Steam Gauges, Belting, Chucks, Drills, Packing, Governors, Jacks, Oil Cups.

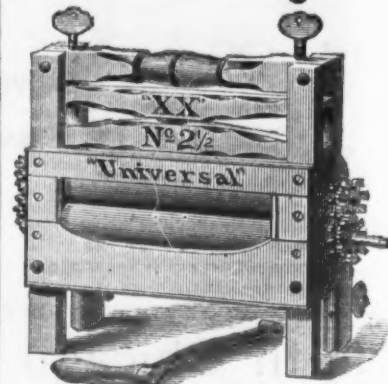
STEAM PUMPS for Pumping, Fire Purposes and Boiler Feeding.

Also VALVES, PIPING and VISES.

The Largest Stock in the City.



# THE "OLD RELIABLE" UNIVERSAL Clothes Wringer.



Improved with Rowell's Double Cog-Wheels on both ends of each roll.

Over 500,000 sold!

And now in use, giving "Universal" satisfaction.

**EVERY WRINGER WARRANTED.**

Be sure and inquire for the "Universal."

Sold by the Principal Jobbers in Hardware and House-Furnishing Goods everywhere.

Special rates given for export.

**Metropolitan Washing Machine Co.**

32 Cortlandt St., New York.



ROUND PLATE.

The Hardware Trade having been 6000 years without a good Caster, is it not time that it deserved one? We offer it.

**PHOENIX CASTER CO.,**  
Indianapolis, Ind.

# TUCKER & DORSEY, MANUFACTURERS.



We make till either for Cash or Scrip.

Our Lock has no Rival

# PHILADELPHIA HYDRAULIC WORKS,

Evelina and Levant Sts.,

# General Machinists

and Manufacturers of

Steam Pumps and Steam Fire Engines.

# STEAM PUMPS

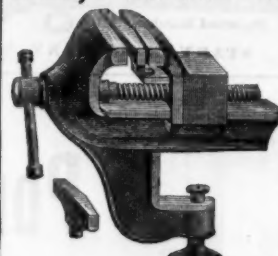
Manufactured by

**Crane Bros.,**

Mfg. Co.

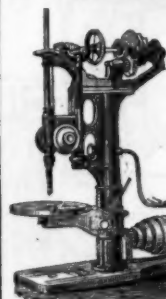
CHICAGO.

# Bonney's Domestic Parallel Vise,



**C. S. BONNEY & SON,**  
4741 Paul St., Frankford, Phila.

# UPRIGHT DRILLS.



NEW PATTERNS.

Geared Head.

Three-change Geared

FEED

for

HAND AND POWER.

Quick return to spindle.

A Splendid Tool,

CHEAP.

Send for Circular.

**EDWIN HARRINGTON**

& SON.

Manufacturers of

MACHINISTS' TOOLS.

Cor. of North Fifteenth St.

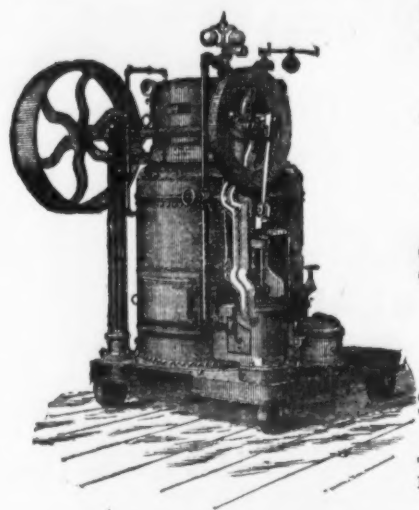
and Pennsylvania Ave.

Philadelphia, - Pa.









## SHAPLEY ENGINE.

Patented Feb. 19, 1874.  
Reissued June 22, 1875.  
Compact, Practical, Durable and Economical.

Acknowledged to be the best in use. This boiler stands unrivaled.

MANUFACTURED BY

### SHAPLEY & WELLS,

Binghamton Iron Works,  
Binghamton, N. Y.

MANUFACTURERS OF

Stationary Engines and Boilers.

Also Machinery for Mills of all kinds and Tanneries. Also their celebrated Bark Mills, acknowledged to be the best. Send for reduced price list circular.

## The Cowles Hardware Co.,

UNIONVILLE, CONN., U. S. A., Manufacturers of

GEER'S

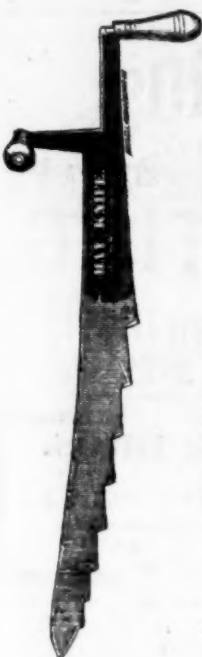
Single and Double Acting  
SPRING BUTTS.

Latest and Best.

Investigate before you  
Purchase.

Large quantities already in use and giving universal satisfaction. Reverse in principle, having Springs for power and Toggles for levers, in combination, so applied as to exert their greatest power when the door is closed; offers less resistance the wider the door is opened; retains the door open after passing the right angle; holds the door up firmly at the top. Orders filled promptly at Factory or by our Agents:

COULTER, FLAGLER & CO., 87 Chambers St., New York; SAM'L G. B. COOK & CO., Baltimore, Md.; BAILEY & RICHARDSON, St. Louis, Mo.; MARKLEY, ALLING & CO., Chicago, Ill.



## LIGHTNING HAY KNIVES, WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

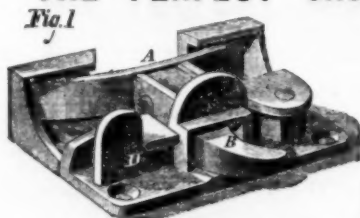
### Hiram Holt & Co.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

SEMPLE & BIRGE MFG. CO., Agents at St. Louis.

## THE PERFECT SASH TIGHTENER AND LOCK.



Manufactured entirely from Malleable Iron, Burglar Proof, Anti-Rattling, Draws Sash to Exact Center. No Springs to Get out of Order.

The Best in the Market.

## METALLIC CLOTHES PIN,

For either Wire or Rope Line,

Will securely hold any article, from a silk handkerchief to a carpet. No article can be blown away. Does not soil the clothing. Manufactured by

CLARK & SMITH, Patentees, Chester, Orange Co., N. Y.

SOLE AGENTS,

### J. I. BROWER & SON,

286 Greenwich St., New York.

Who keep a general assortment on hand for the country trade. Jowett's Horse Ramps, 14, 15 and 16 inch, Maharaj's \$10 Tire Shrinker, Heller's Ramps. Send for Circular. SPECIAL DISCOUNTS TO JOBBERS.

## G. W. Bradley's Edge Tools.

Butchers' Cleavers,  
Butchers' Choppers,  
Axes and Hatchets,  
Grub Hoes and Mattocks,  
Mill Picks,  
Box Chisels and Scrapers,

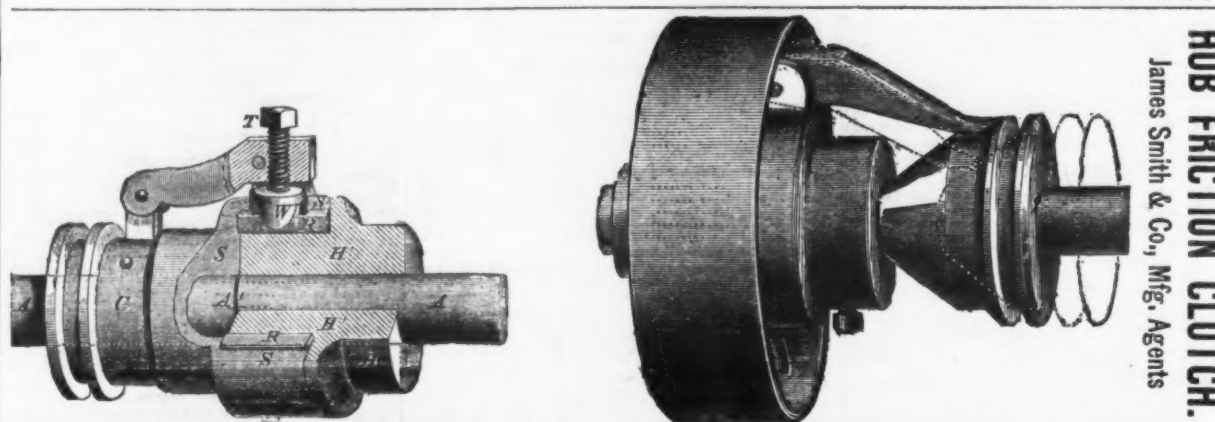
Ring Bush Hooks,  
Ax Eye Bush Hooks,  
Socket Bush Hooks,  
Watt's Ship Carpenters' Tools,  
Carpenters' Drawing Knives,  
Coopers' and Turpentine Tools.

FOR SALE BY

MARTIN DOSCHER, Agent, 96 Chambers Street, N. Y.



PAT. DEC. 1873  
PAT. FEB. 1876  
REISS. JUNE 1877  
PATENT  
Expanding, Self-Draining  
RUBBER BUCKET.  
Manufactured only by  
L. M. RUMSEY & CO.



## PATENT HUB FRICTION CLUTCH.

Manufactured by the HUB FRICTION CLUTCH CO., Limited, Philadelphia.

We claim for this device the following advantages for a perfect clutch, it having been adopted by several of the leading manufacturers of machinery and machinists' tools: It works easily but effectively. It works instantly and without noise. It is very durable, and is extremely simple and cheap, and has proven itself to be the best clutch in the market. Special arrangements can be made with leading manufacturers for the adoption of this clutch for their own tools. This clutch can and will be sold for less money than any other clutch in the market.

For sale by Geo. V. Casson, Philadelphia; Moskos, Reed & Co., Baltimore. JAMES SMITH & CO., Mfg. Agents, 137 Market Street, Philadelphia.

H. S. MANNING & CO., NEW YORK AGENTS, 211 Liberty Street.

## THE EAGLE ANVIL!! WARRANTED!!



(ESTABLISHED) 1843.

These Anvils are superior to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvil is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more solid material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a summer one-fifth lighter than that required when using a wrought iron anvil.

The working surface is in one piece of JESSUP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The heavy is covered with and its extremity made entirely of steel. The body of the Anvil is of the strongest grade of American iron, to which the cast-steel face is warranted to be thoroughly welded and not to come off.

Price List, October 1st, 1878. ANVILS weighing 100 lbs. to 800 lbs., see per lb. Smaller Anvils, ("Minims.")

| No. | Weight | Price  |
|-----|--------|--------|
| 1   | 5 lb.  | \$1.00 |
| 2   | 10 lb. | \$1.50 |
| 3   | 15 lb. | \$2.00 |
| 4   | 20 lb. | \$2.50 |
| 5   | 30 lb. | \$3.50 |
| 6   | 40 lb. | \$4.50 |
| 7   | 50 lb. | \$5.50 |
| 8   | 60 lb. | \$6.50 |
| 9   | 70 lb. | \$7.50 |
| 10  | 80 lb. | \$8.50 |

N.B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trades.)  
New York.—Messrs. TENNIS & WILSON.—RUSSELL & ERWIN MFG. CO.—Messrs. HORACE DURRIE & CO.,  
Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE  
Louisville.—Messrs. W. B. BELKNAP & CO. FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.

**Eddy Valves.**  
**FIRE HYDRANTS.**  
Yard Hydrants,  
Street Washers.  
**DODGE HAY PRESS.**  
"DRAW-UP" PRESSES,  
For Domestic use, Drugs, &c.  
**LARD & TALLOW PRESSES.**  
See The Iron Age of July 4, 1878.  
Axe, Hatchet, Powder and Brush  
Machinery.  
**IRON AND BRASS CASTINGS.**  
Pulleys and Shafting.

Send for Catalogue of the



## FIRMENICH Safety Steam Boiler.

The Boiler that made the hottest, dryest and greatest quantity of Steam at the Centennial Exhibition. Tubes never require cleaning or scraping. Boilers in use for four years without getting dirty.

J. C. & F. FIRMENICH,  
Office, 13 Mortimer Street, Buffalo, N. Y.

### JOHN STARR,

Hardware & Metal Broker,

AND  
MANUFACTURERS' AGENT,

Halifax, Nova Scotia,

Representing in the Dominion of Canada several American Manufacturers, is ready to accept further Agencies. Satisfactory references.

## NEW IRON TACKLE BLOCKS.

Norcross Patent.



Galvanized Malleable Iron Shell and Sheave, Steel Hooks, Steel Pins.

Superior to Wood Blocks on account of not Checking and Cracking.

The Strongest, Lightest, Easiest Running and most Durable Block yet produced.

Send for sample and price list of same to



## Providence Tool Co., PROVIDENCE, R. I.

Or to J. H. Work, 13 Pearl St., Boston, Mass.; S. H. & E. Y. Moore, 68 Lake St., Chicago, Ill.; Henry B. Newhall, 11 Warren St., N. Y.

HUNDLEY & HANKS,  
PROPRIETORS OF

## NORTH CAROLINA HANDLE CO.



MANUFACTURERS OF  
Handles and Spokes,

79 Reade Street and 97 Chambers Street,  
HARDWARE COMMISSION MERCHANTS,  
NEW YORK.



## Common Sense Hoisting Block.



Just the Block for  
**HOISTING ICE.**

THE  
**PENFIELD BLOCK WORKS,**

Lockport, N. Y.



## THE H P HORSE NAIL CO.,

Cleveland, Ohio.

These Nails

are manufactured from the  
**Best Selected Stock.**

Send for circulars showing dis-

counts.



These Nails

are

Guaranteed to be Equal

to the best in the market, and are

sold at greatly reduced rates.

5d 6d 7d 8d 9d 10d  
26c. 23c. 21c. 20c. 19c. 18c.

## NORTHWESTERN HORSE NAIL CO.

ESTABLISHED IN 1865.

**Hammered & Finished Horse Nails.**

We offer our Finished Nail to the trade with the confidence that it has no equal in the market. It is the genuine "Northwestern" Nail, Finished, and we give it our unqualified guaranty.

Office and Factory, 56 to 68 Van Buren St., Chicago.

**A. W. KINGSLAND, Secretary.**

Our agents, Graham & Haines, 113 Chambers Street, New York, carry a full line of our goods, and will be pleased to serve you at Factory prices.

## GLOBE NAIL COMPANY,

MANUFACTURERS OF

**Pointed Polished & Finished Horse Shoe Nails.**

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

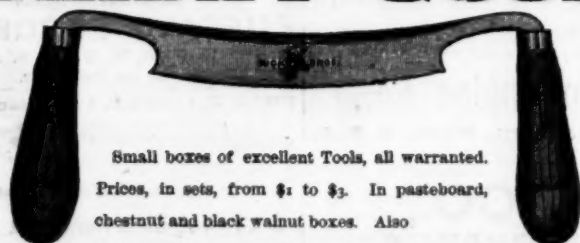
**GLOBE NAIL CO., Boston, Mass.**

## THORNE, DeHAVEN & CO., Drilling Machines,

21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction.  
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.  
VERTICAL DRILLS. Self-feeding.  
MULTIPLE DRILLS. 2 to 20 Spindles.  
HORIZONTAL BORING AND DRILLING MACHINES.  
HAND DRILLS. CAR BOX DRILLS.  
SPECIAL DRILLS. For Special Work.

## HOLIDAY GOODS.



Small boxes of excellent Tools, all warranted.  
Prices, in sets, from \$1 to \$3. In pasteboard, chestnut and black walnut boxes. Also

## AMATEURS' CARVING TOOLS.

No. 5, \$4.50 per doz.



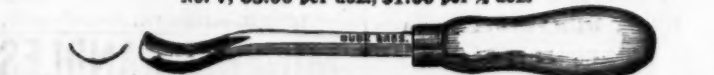
No. 3, \$4.50 per doz.



No. 3, \$3.25 per doz., \$1.75 per 1/2 doz.



No. 7, \$3.00 per doz., \$1.60 per 1/2 doz.

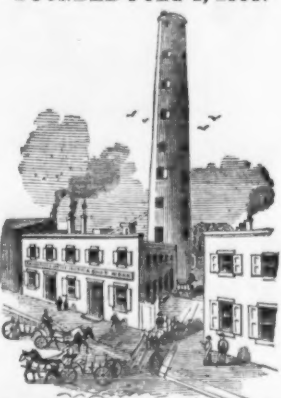


Of the best quality. All handled and ground sharp. Put up in sets of 3, 4, 6, 8, 10 and 12 tools. These tools are all made by hand, and are forged from the best quality cast steel, and every tool is stamped with our name.

**BUCK BROTHERS,**

RIVERLIN WORKS, Millbury, Mass.

The Oldest Shot Tower in America.  
FOUNDED JULY 4, 1808.



**THOMAS W. SPARKS,**

Manufacturer of

**SPARKS'**

**American Chilled Shot,**

Rivaling the English and all Others.

**STANDARD DROP & BUCK SHOT**

AND BAR LEAD.

121 Walnut Street, Philadelphia.



Our SPECIALTIES are

admitted to be the best

in the world of their kind

after 5 years of trial.

Send for 18 page book

(10 Illustrations) with

Discount Sheet. List

includes Belting, Grain

Scoops, Etc.

THE RIVET BUCKET CO.

N. HAWKINS, Sec'y.

64 & 66 Franklin St., CHICAGO.

Pat. Pending.

Corrugated

BELT BOLT.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

Pat. Pending.

## "CLIMAX" ICE CREEPERS



"A" represents the Creeper in position ready for use.  
"B" shows the Creeper thrown back entirely out of the way when not in use, or walking in doors.

For prices and terms to the trade, address the manufacturers,

**CHILDS, GROFF & CO.,**

Cleveland, O.

## Moseley Iron Bridge & Roof Co.,

CORRUGATED IRON  
Buildings, Roofs, Shutters,  
Doors, Iron Sashes,  
Skylights, &c.

5 Day Street, New York.

## WESTON DYNAMO-ELECTRIC MACHINE NICKEL.

The rapid increase in the use of Nickel-Plating owing to the introduction of the Weston Machine and the very low price of nickel material, enables us to give greatly reduced estimates for complete outfits.

We are furnishing outfits specially adapted for Stove Work, giving a pure white deposit on plain or mat surfaces.

Outfits complete, with Dynamo-Electric Machine Tanks, Anodes, Solution, &c., &c., \$250.

We beg to refer to the following Stove Manufacturers among 500 other houses using the Weston Machine: Richardson & Boynton, S. S. Jewett & Co., Fuller, Warren & Co., Perry & Co., Detroit Stove Works, Michigan Stove Co., Co-operative Stove Co., E. & C. Gurney, Hamilton & Toronto, and many others.

INFRINGEMENTS.  
We call attention to infringements of the Weston Machine, in which Automatic Switches are used to prevent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

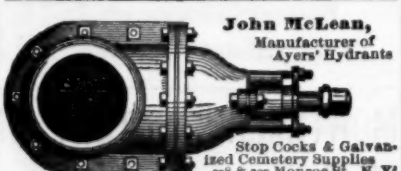
**CONDIT, HANSON & VAN WINKLE**  
Sole Agents  
NEWARK, N. J., U.S.A.

ENGLISH AGENCY: 18 Caroline Street, Birmingham.

## NICKEL PLATING.

**J. HARTMAN,**

37 1/2 North 7th Street, PHILA.



**John McLean,**

Manufacturer of

Ayers' Hydrants

Stop Cocks & Galvan-

ized Conductivity Supplies

291 & 300 Monroe St., N. Y.



**"DRAW CUT"**

BUTCHERS' MACHINES.

Choppers, Hand and Power.

Stuffers.

Lard Presses.

Warranted thoroughly made and

the BEST IN USE.

**MURRAY IRON WORKS,**

Burlington, Iowa.

## PEERLESS WRINGER CO.

New York Office:  
106 Chambers Street.

THE

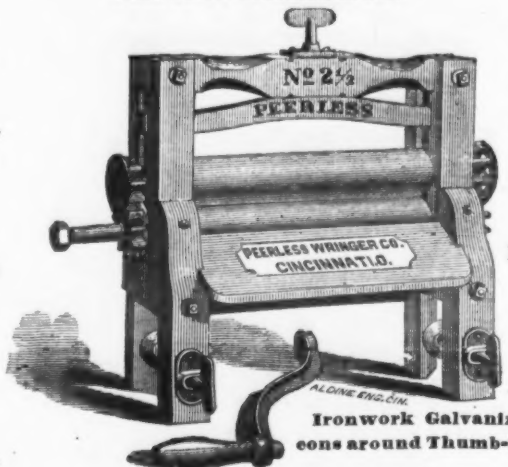
Factory:  
Cincinnati, O.

## New and Improved Peerless Wringer,

Which, in addition to the Highest Possible Finish, combines the following

POINTS OF EXCELLENCE:

Solid White  
Rubber Rolls,  
Metal  
Journal Boxes,  
Patent Crank  
Fastening,  
Rubber  
Fastening Pads,  
Maple Frames.  
Strongest  
Frame  
Made.



Wrought Iron  
Thumbscrews,  
Apron or  
Clothes Guide,  
Hickory  
Spring Bar,  
Moulded  
Rubber Springs,  
Best and  
Most Simple  
Tub  
Attachment.

Ironwork Galvanized. Escutcheons around Thumb-Screws.

Nothing can get out of order and be broken. Warranted double the capacity of any Purchase Gear Wringer.

**GIVE US A TRIAL ORDER.**

### CHAS. W. ERVIEN & CO.

IRELAND ST.  
Kensington, PHILAD'A

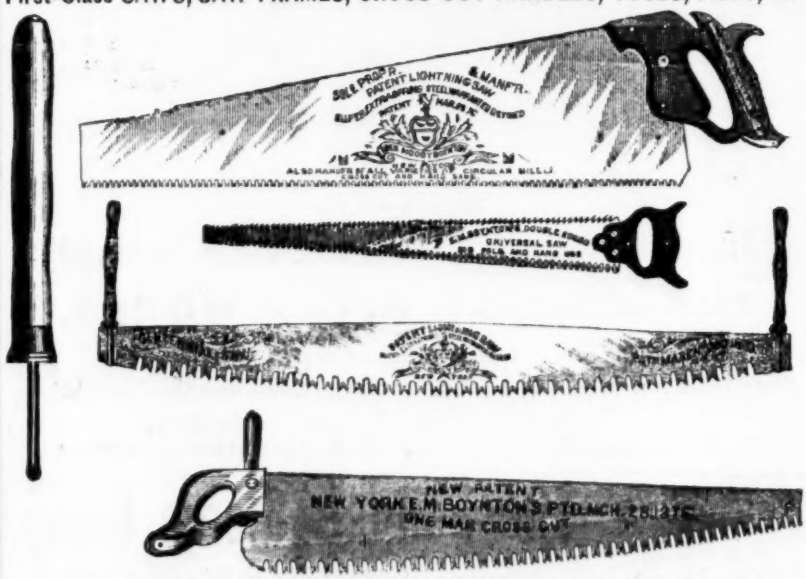
BUILDERS OF  
STATIONARY & MARINE  
ENGINES, BOILERS  
SHAFTING, GEARING,  
AND  
MILL WORK  
GENERALLY.  
Special Machinery  
BUILT TO ORDER.

Vertical  
AND  
Horizontal  
Engines,  
Of New and Heavy De-  
signs, from 2 to  
100 H. P.,  
on hand or in process of  
erection.

## E. M. BOYNTON,

Manufacturer of all kinds of

First-Class SAWS, SAW FRAMES, CROSS-CUT HANDLES, TOOLS, FILES, &c.



Sole Proprietor and Manufacturer of the GENUINE PAT. LIGHTNING SAW.

No. 80 BEEKMAN STREET, NEW YORK.



## BUERK'S Watchman's Time DETECTOR.

IMPORTANT FOR ALL LARGE CORPORATIONS  
AND MANUFACTURING CONCERNS.

Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wires communicating from room to room, as is the case with the ordinary watch clocks. A small, inexpensive stationary key is alone required at each station. The instrument will, in all cases, be warranted perfect and satisfactory.

N. B.—The suit against Imhaeuser & Co., of New York, was decided in my favor, June 10, 1874. Another suit has been decided against them and a fine assessed Nov. 11, 1876, for selling contrary to the order of the Court. Persons using clocks infringing on my Patent will be dealt with according to law.

**J. E. BUERK, Proprietor,**

P. O. Box 979.

No. 230 Washington Street, Boston.

In sending for circular, or ordering the above, please mention this paper.



# ELEVATORS.

Hydraulic Elevators to run from City Pressure.  
Condensed Air and Hydraulic Elevators operated by Steam Pump.  
Independent Steam Elevators.  
Belt Power Elevators.  
Portable Hoisting Machines.  
All kinds of Hoisting Machinery a specialty.

PASSENGER ELEVATORS.



DOUBLE DRUM PORTABLE HOIST.

STOKES & PARRISH, 3001 Chestnut St., Phila.

## THE MACKENZIE PATENT CUPOLA & BLOWER.

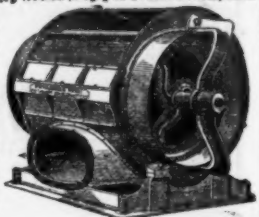
Send for circular to

Smith & Sayre Mfg. Co.,

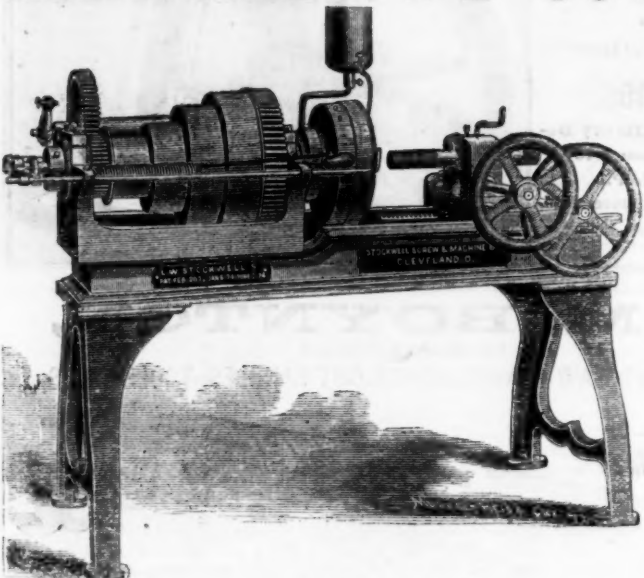
PROPRIETORS, 21 Cortlandt St., New York.



This Cupola has made a great revolution in melting iron. It differs from all others in having a continuous tapers, or in other words, the blast enters the fuel at all points. Above one ton capacity per hour, they are made oval in form. This brings the blast to the center of the furnace. With the least resistance and smallest possible amount of power, and in combination with the continuous tapers causes complete diffusion of the air throughout the furnace, and uniform temperature, melting ten or fifteen tons an hour with the pressure of blast required to melt two or three tons in an ordinary Cupola. It also enables us to save very largely in time and fuel, the experience of our customers showing a gain of twenty-five to fifty per cent. in time, and twenty-five to forty per cent. fuel over the ordinary Cupola, and a better quality of casting, especially in light work. This is due to the thorough diffusion of the air and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting. We manufacture these Cupolas of any desired capacity, numbered from 1 to 25, inclusive, the numbers indicating the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 25 or 30 tons. We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own, and the experience of our customers, could suggest.



## BOLT AND PIPE CUTTER.



With our Patent Nut Tapping Device nuts can be tapped very rapidly.

No. 1 cuts 1/4 to 1 inch.  
No. 2 " 3/8 to 1 1/2 "  
No. 3 " 1/2 to 2 "  
No. 4 " 3/4 to 3 "

Send for new illustrated catalogue and price list.

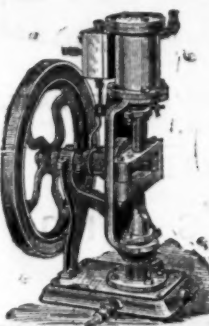
Manufactured by the STOCKWELL SCREW & MACHINE CO., Cleveland, O.

## OLD COLONY RIVET WORKS,

KINGSTON, MASS.,

MANUFACTURERS OF

Rivets, Hand Iron Cutters, Punches, Shears, and Planing and Shaping Machines, Universal Ratchet Drills, and Patent Tinners' Snips.  
New York Warehouse, 116 Chambers Street.



## The Eclipse Steam Pump.

(Patented May 17, 1878.)

A New, Cheap and Simple Boiler Feeder.

This differs from any Pump of its class by doing away with a sliding box or strap, and supplying the places of the same by a hardened steel roller and steel pin. By this construction a great amount of friction is avoided. It is durable, handy and cheap. Anyone of ordinary intelligence can successfully operate it. Prices range from \$45 upwards.

Send for circular.

M. SHULTZ,

No. 170 Plum Street, CINCINNATI, OHIO.

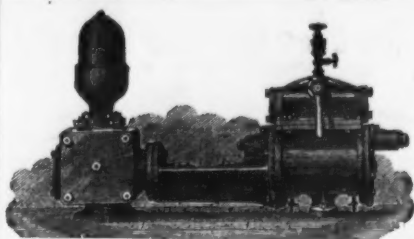
NORTH'S PATENT

## Universal Lathe Dog.

It is very strong. Holds very strong. Will not deface finished work. Holds round, square or irregular work. Always stands up square with the work and will not "skew." Is more evenly balanced than the common dog.

Send for circular.

SELDEN G. NORTH, No. 347 North 4th Street, Philadelphia, Pa.



## A. S. CAMERON'S PATENT

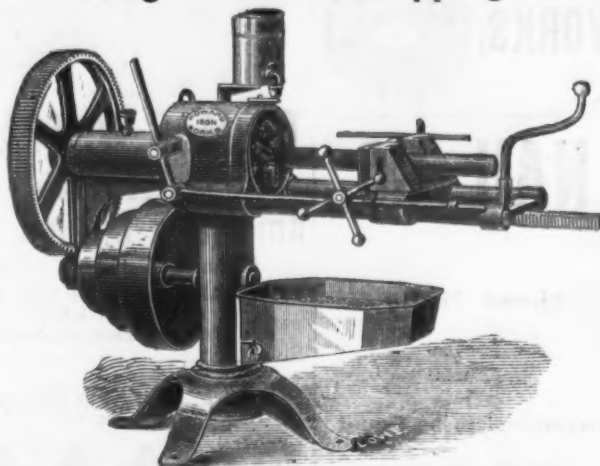
## "SPECIAL" STEAM PUMP

Is the Standard of Excellence at Home and Abroad.

For reduced price lists address A. S. CAMERON, East 23d Street, New York.

## SCHLENKER'S

## Screw Cutting and Nut Tapping Machines.



This engraving represents a No. 5 1/2 Machine, and cuts from 1/2 to 2 inches.

MANUFACTURED BY THE

HOWARD IRON WORKS, Buffalo, N. Y.

## Wiley & Russell Mfg. Co.,

Greenfield, Mass.

Green River Tire

Upsetters,

Green River Drills,

Lightning Screw Plates,

Lightning Bolt Cutters,

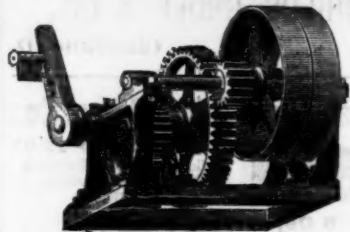
AND

Other Labor Saving Tools.



## BEECHER & PECK,

Successors to Milo Peck, Manufacturers of



Send for Price List.

## PECK'S DROP PRESS

Newspaper Directing Machines, &c.

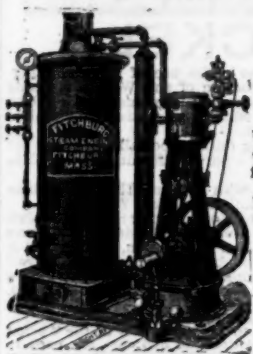
Special attention given to the making of all Drop Dies.

Special Machinery Fitted Up to Order.

NEW HAVEN, CONN.

## STEAM ENGINES,

Vertical or Horizontal.



Combined, as in cut, 2 to 12 H. P., or on independent beds, 2 H. P. upwards to 200 H. P. Plain or with Automatic Variable Cut-off. We can refer to hundreds in use, of all sizes, giving perfect satisfaction.

Yacht Engines and Steel Boilers, Shafting, Pulleys, Hangers, &c.

Send for pamphlet, stating where you saw this, to

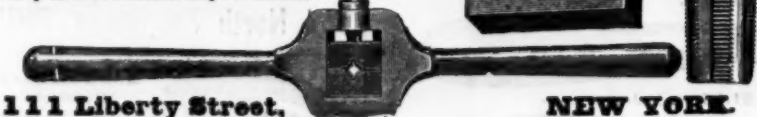
Fitchburg Steam Engine Co.,

Fitchburg, Mass., U. S. A.

## H. S. MANNING & CO.,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers, also of Solid Bolt and Pipe Dies. Furnished either in V or U. S. Standard shape of threads.



111 Liberty Street,

NEW YORK

## MORTIMER'S PATENT RAPID TRANSIT WRENCH,

For SIMPLICITY, CONVENIENCE, DURABILITY and STRENGTH it has no equal.

They are made of drop forging of best material; the sliding jaw of cast steel. A slight pressure with the thumb upon the strap of the jaw over the spring, sets the wrench to any size in a moment.

Manufactured by

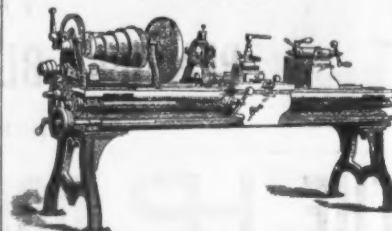
ISRAEL H. JOHNSON, JR., & CO.,

Manufacturers of Lathes and General Machinery,

OFFICE AND FACTORY, 18th and Noble Sts., PHILADELPHIA, PA.

## P. BLAISDELL & CO.,

Manufacturers of



## MACHINISTS' TOOLS,

Blaisdell's Patent Upright Drills, With Quick Return Motion.

Engine Lathes, Planers, Boring Mills, Gear Cutters and Hand Lathes.

WORCESTER, MASS., U. S. A.

## Hoisting Engines

OF ANY POWER,

WITH

Improved Patent Friction Drums.

Adapted for Mines, Dock Building, Pile Driving, Quarries, &c.

J. S. MUNDY,

7 E. R. Ave.,

Newark, N. J.

## HARRIS CORLISS ENGINE,

Built by WM. A. HARRIS, Providence, R. I.

The ONLY place where this Engine can be obtained.

The best and most workmanlike form of the Corliss Engine now in the market, substantially built of the best materials, and in both condensing and non-condensing forms. The Condensing Engine will save from 25 to 35 per cent. of fuel, or add a like amount to the power and consume no more fuel. Small parties are made in quantities and interchangeable, and kept in stock for the convenience of repairs and to be placed on new work ordered at short notice. No other engine builder has authority to state that he can furnish this Engine. The only works where this Engine can be obtained are at Providence, R. I., no outside parties being licensed. Send for pamphlet containing full details, also list of sizes with h. p.

For the convenience of Western Parties meaning business and wishing to confer with me at any stated time at their Mill or Works, I will visit them by receiving notice and giving me latitude of two to four weeks. Those visiting New York and wishing to confer with me there by appointment, will find me or my agent every Wednesday (or Thursday if so stated in appointment) at H. T. Brewster's Office, 57 Liberty St.

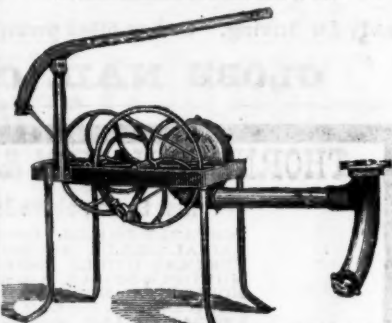
WM. A. HARRIS, PROPRIETOR.

The Only Perfect Hand Blower made.

BUFFALO

## Portable Forges and Hand Blowers.

(C. Hammelmann's Patent, July 3, 1877.)



Light, Compact, Symmetrical, Strong, Durable.

MANNER OF OPERATING ENTIRELY NEW.

Manufactured by the

BUFFALO FORCE CO.,

Buffalo, N. Y., U. S. A.

Send for Circular and Price Lists.

CHAS. E. LITTLE, 59 Fulton St., N. Y.



## Solid Cast Steel Augers & Reamers

For Boring PUMP LOGS. All sizes in stock. Socket Shank, Ring Handles, and Connecting Rods for the above to order. Also "Feathering" Tools for joining log ends. Coopers' and Blasters' Tools, Tool Chests. Tools for all trades a specialty.



Flanders' Improved Locomotive Cylinder Boring Machine.

Bar and screw of cast steel, with two extra cutter heads. Manufactured and for sale by the

L. B. FLANDERS MACHINE WORKS,

1025 Hamilton St., Philadelphia, Pa.

## MINERS' CANDLES.

superior to any other Light for Mining

Purposes. Manufactured by

JAMES BOYD'S SON,

Nos. 10 & 12 Franklin St., New York.







## TUBAL SMELTING WORKS,

760 South Broad Street, PHILADELPHIA.  
PAUL S. REEVES,  
MANUFACTURER OF

### ANTI-FRICTION METALS.

|                  |     |        |     |
|------------------|-----|--------|-----|
| XXX Gemline..... | 55c | C..... | 17c |
| XX.....          | 53c | D..... | 14c |
| X.....           | 50c | E..... | 13c |
| A.....           | 30c | F..... | 10c |
| B.....           | 30c |        |     |

Note:—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

INGOT BRASS. | OLD METALS AND TURNINGS WANTED. | BRASS CASTINGS.

ESTABLISHED 1842.

## WM. & HARVEY ROWLAND

PHILADELPHIA,

P. O. Address: Frankford, Philad'a. } MANUFACTURERS OF ALL KINDS OF

## Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.  
CAST SHOVEL, HOE AND MACHINERY STEEL.

WYFOND TOE, SLRIGH, TIRE AND SPRING STEEL.

BESSEMER SHOVEL AND PLOW STEEL.

BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.  
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

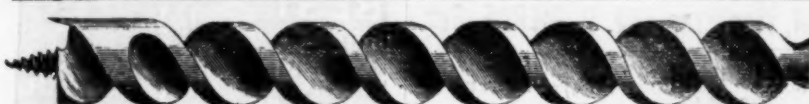
FRANCIS B. GRIFFIN.

C. E. JENNINGS.

## C. E. JENNINGS & CO.,

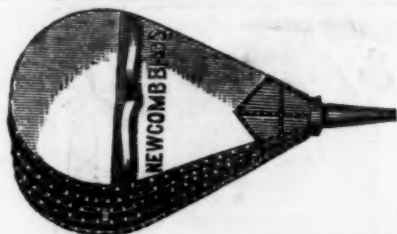
98 Chambers St., New York.

Sole Agents for L'HOMMEDEU and WATROUS & CO. Ship Augers and Bridge Builders' Augers; E. H. TRACY, Scotch Pattern and Railroad Augers; NOBLES MFG. CO., Carpenters' Augers, Bits and Drawing Knives; ELI SMITH, Patent Mining Knives; GEO. S. WILDER, Merrill's Chisels and Drawing Knives; COGN. ALLEY HARDWARE CO. Solid Head Bits; NEWCOMB BROS. Hand, Boulders' and Blacksmiths' Bellows. Agents for H. H. MAYHEW & CO. Sheppardson's Bits; BENJAMIN PIERCE Auger Bits; PHILLIPS MFG. CO. Boring Machines; C. L. JEFFORDS, Axes and Hatchets; BARBER'S Patent Countersinks; BONNEY'S Hollow Augers; L. D. FROST'S Philadelphia Carriage Bolts.



This Cut is a full size illustration of Conn. Valley Hardware Co.'s Patent Solid Head Auger Bit. 8-16 This Bit has no equal for boring hard wood. In cross grain, knots, and the end of the wood its great superiority over any other is strongly marked. The solid head guarantees a perfectly straight hole.

C. E. JENNINGS & CO., Sole Agents.



## NEWCOMB BROS.,

Manufacturers of

## BELLOWS

Of all Descriptions.

We use only the best oak-tanned cow hide leather and seasoned poplar wood.

OFFICE AND DEPOT,

C. E. JENNINGS & CO., 98 Chambers St., N. Y.

## IMPROVED STEEL CASTINGS.

Under Hainsworth's Patents.

We make Castings practically free from blow-holes, of steel which is as soft and as easily WORKED and WELDED as Wrought Iron, yet is STIFF, STRONG and DURABLE, with a TENSILE STRENGTH of not less than 65,000 lbs. to the square inch. In short, OUR CASTINGS UNITE THE QUALITIES OF STEEL AND WROUGHT IRON.

Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landsides.

WE USE NO CAST IRON.

Send for circular.

## PITTSBURGH STEEL CASTING CO.,

PITTSBURGH, PA.



Manufacturer of TAPS AND DIES of every description. Also, for sale low, UNITED STATES STANDARD GAUGES, from 1/4 to 3 inch.

## C. Merrill & Sons

556 Grand St.,  
NEW YORK.

## DROP

HAMMERS,  
FORGINGS and  
POWER PRESSES.

The Black Star Anti-Incrustant and Acid Water Neutralizer.  
For Removing Scale from Boilers. For Preventing the Formation of Scale in Boilers.  
For Neutralizing Mine and Acid Waters.

ALLAN WOOD & Co., Conshohocken, Pa.  
LEHIGH ZINC CO., Bethlehem, Pa.  
SCOTT FOUNDRY, Reading, Pa.  
COLLEGE IRON CO., Reading, Pa.  
HOBBS AND READY IRON WORKS, Stewart Co., Tenn.  
Send for pamphlet.

ALLIANCE COAL MINING CO., Pottsville, Pa.  
VAN ALLEN & Co., Northumberland, Pa.  
PENNSYLVANIA ANTHRACITE COAL CO., Scranton, Pa.  
H. B. HILLMAN, Wilkes-Barre, Pa.  
CHICKIES IRON CO., Chickies, Lancaster Co., Pa.  
S. B. BRISCOE & CO., Pottsville, Pa.

The Reading Bolt & Nut Works. J. H. Sternbergh, Reading, Pa., U. S. A.  
Manufacturer of a Superior Quality of

## MACHINE BOLTS, HOT PRESSED NUTS,

Railroad Track Bolts, Boiler and Bridge Rivets, Bolt Ends, Washers, Wood Screws, Turnbuckles, Refined Bar Iron, Etc., Etc., Etc.

## STANLEY G. FLAGG & CO.

PHILADELPHIA, PA.  
Office and Warehouse,  
No. 216 & 218 N. THIRD ST.

### STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.  
Circulars sent on application.

### STEEL CASTINGS

From 1/4 to 10,000 lbs. weight, true to pattern, sound and solid, of unequalled strength, toughness and durability. An invaluable substitute for forgings or cast iron requiring threefold strength. Gearing of all kinds, Shafts, Dies, Hammerheads, Crossheads for Locomotives, etc. 15,000 Crank Shafts of this steel now running proved superior to wrought iron. Circulars and price lists free. Address

CHESTER STEEL CASTINGS CO.,  
Evelina St., Philadelphia, Pa.

## Steel Castings,

Light and heavy Steel Castings of superior metal, solid and homogeneous. All work guaranteed. Send for circular.

EUREKA CAST STEEL CO.,  
Chester, Pa.  
Office: 307 Walnut St., Phila.

## DIAMOND



## LANTERN.

## R. E. DIETZ,

54 & 56 Fulton St., N. Y.,

Manufacturer of

TUBULAR LANTERNS,

"Catch-em-Alive" Mouse Traps.

Heads Polished and Lacquered.

PAT. MAR. 31, 1874

MAL-LEABLE IRON WEDGE  
NEATLY PUT UP IN DOZ. WEDGES AND  
1000 COMIC CIRCULAR IN EACH BOX  
MANUFACTURED ONLY BY  
AMERICAN SLEIGH  
AND CARRIAGE IRON CO.  
BOSTON MASS.

Special attention paid to packing for export trade; 200 dozen sold in 1877. Price, \$4.50 per gross; one sample by mail, too; one dozen by mail, too; one dozen by mail, too. For sale by wholesale trade throughout the United States and Canada.

## GENUINE CONCORD AXLES

Warranted the best Article in the Market.

MANUFACTURED ONLY BY

D. ARTHUR BROWN & CO., Fisherville, N. H.

Machines

AND

Wheels

Guaranteed.



Send for  
Illustrated  
Circular  
and Prices.

Wellsport,  
PA.



Phosphor-Bronze.

Cylinders, Hardware, Bearings, Valves, Belts, Steam Whistles, Hammered Piston Rods, Wire, Rods, Sheets, Bolts, Tubes, Plates, etc. Apply to the PHOSPHOR-BRONZE SMELTING CO. Limited, 202 Washington Ave., Philadelphia, Pa., Sole Manufacturers in U. S.

## PATTERNS, MODELS

and Experimental Machinery of every description, made by

WM. BURROWS, 90 Fulton St., N. Y.

## NASH & KOEHLER,

Late EICKHOFF MFG. CO.

### Stencil Establishment

ALPHABETS, FIGURES AND BRUSHES,

280 Pearl Street, NEW YORK.

Celebrated Hard Stencil Ink all colors, Steel Stamps, Letters, Figures and Burning Brands, Seal Presses, Hotel Baggage Checks, etc. Rubber Hand Stamps.

Scranton Brass Works,

J. M. EVERHART

Manufacturer of

BRASS WORK,

For Water, Gas & Steam. Also

Car & Wilcox Patent Cut Files.

Will cut faster, wear longer, and clog less than any file in market.

ONE STREET, SCRANTON, PA.

## Russell, Burdsall & Ward,

PORT CHESTER, N. Y.

Manufacturers of

Carriage, Tire, Plow, Stove  
AND OTHER

## BOLTS.

Carriage Bolts made from Best Square Iron a Specialty.

## JOHN RUSSELL CUTLERY CO.,

Green River Works,

MANUFACTURERS OF

## Table and Pocket Cutlery,

BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

FIRST HOME MANUFACTURERS.

New York Office,

90 Chambers Street.

Factories,

Turners Falls, Mass.



## GRAHAM & HAINES,

P. O. Box 1040.

113 Chambers and 95 Reade Streets, New York.

HARDWARE MANUFACTURERS' AGENTS, as follows:

Lawrence Curry Comb Co.,  
Carry Combs.  
Hoard Bros. & Co.,  
Cotton, Wool and Curry Cards.  
Thompson, Derby & Co.,  
Scythe Snaths.  
Steel Forks, Rakes, Hoes, &c.  
H. Knickerbocker,  
Scythes, Axes and Tools.  
H. W. Kipp, Nail Hammers.  
Kloman, Park & Co., Vises,  
Picks, Mattocks, Grub Hoes, &c.  
Jacobus & Nimick Mfg. Co.,  
Locks, &c.  
Sandusky Tool Co.,  
Planes and Plane Irons.  
Geo. M. Eddy & Co.,  
Measuring Tapes.  
Wheeling Hinge Co.,  
Hinges and Wrought Butts.  
Northwestern Horse Nail Co.,  
Horse Nails.  
A. G. Coes & Co.,  
Coes' Genuine Screw Wrenches.  
F. K. Silby, Emery Cloth.  
Holroyd & Co., Stocks & Dies.  
Sedgwick Mfg. Co.,  
Butter and Flour Trainers, etc.  
Ripley Mfg. Co., Mouse Traps.  
Sims' Loring,  
Plymouth Tack & Rivet Works.  
Carr, Crawley & Deelin,  
Miscellaneous Hardware & Cast Butts.  
J. Mallinson,  
Cast Steel Shears and Scissors.  
Ketchum's Pat. Metallic Sieves.  
W. D. Turner & Co.,  
Geneva Hand Files.  
D. B. Niles & Son,  
Hand and Sleigh Bells.  
C. S. Osborne & Co., Com-  
passes, Calipers, Dividers, &c.  
C. W. Maguire, Brushes.  
Clark Bros. & Co.,  
Carriage Bolts, &c.  
Louverre & Tucker, the Genu-  
ine Knox Filing Machine.  
T. B. Barclay,  
"Dodge's" Kentucky Cow Bells.  
Lane Bros., Swifts and Gro-  
cers' Coffee Mills and Measuring  
Faucets, &c.  
T. C. Richards Hardware Co.,  
Bright Wire Goods, Picture Nails,  
&c.

## I. B. DAVIS,

Manufacturer of the

Berryman Patent Feed Water Heater and Purifier

AND

ECONOMIC FEED PUMP.

This Pump is designed for use where cheapness in first cost, economy in run-  
ning and great durability are required.

New York Office, 97 Liberty St.

H. T. BREWSTER, Manager.

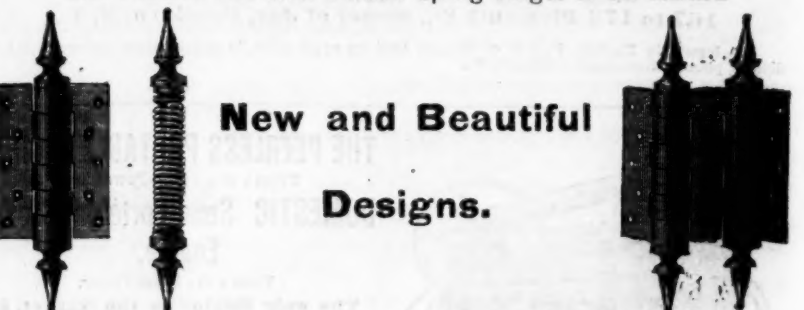


LYON & FELLOWS MFG. CO.,  
Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

## Am. Spiral Spring Butts

WARRANTED TO BE THE

Most Powerful and Most Durable Spring Hinges in the Market.



New and Beautiful

Designs.

The same Butts can be used for either right or left hand doors. Send for reduced price list  
March 1, 1877.

MANUFACTURED BY

THE AMERICAN SPIRAL SPRING BUTT CO.,

No. 33 BECKMAN STREET, NEW YORK.

## Rod and Coil Door Springs,

GEM,

STAR,

TORREY,

GRAY'S

MANUFACTURED BY

VAN WAGONER & WILLIAMS, 82 Beekman St., New York.

## BALTIMORE RIVET AND SPIKE WORKS.

Rivets,  
Spikes,  
Bolts,  
Nuts,



Washers,  
Bolt Ends,  
Wood Screws,

WM. GILMOR of WM., cor. President & Fawn Sts.